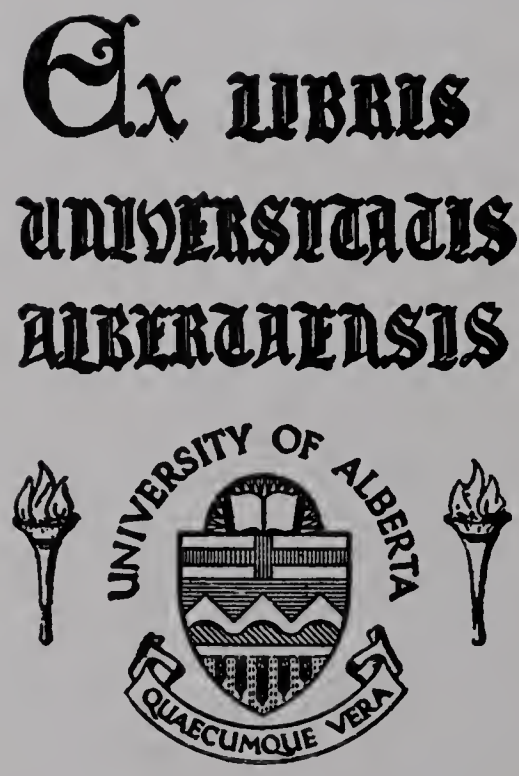

THE UNIVERSITY OF ALBERTA

ACADEMIC ACHIEVEMENT OF SLOW LEARNERS IN THE EDMONTON CONTINUOUS PROGRESS PLAN

by

ALBERT LUST

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Academic Achievement of Slow Learners in the Edmonton Continuous Progress Plan," submitted by Albert Lust in partial fulfilment of the requirements for the degree of Master of Education.

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ABSTRACT

This study was designed to investigate the probability that there would be no significant difference in academic achievement between a group of slow learners in the seven-year program of the Continuous Progress Plan and a group of grade repeaters in the Graded Program of the Edmonton Public School System.

The Continuous Progress Plan was introduced to the Edmonton Public School System in the spring of 1957, and by the autumn of 1962 all elementary schools were operating under this plan. During the 1964-65 school term there were a sufficient number of designated slow pupils in the sixth and seventh year of the Continuous Progress Plan, and a sufficient number of pupils in grades five and six of the Graded Program who repeated one grade to warrant an evaluation and comparison of the two elementary programs.

These groups of low academic achievers were given the Iowa Tests of Basic Skills and the Edmonton Public School's standardized tests in June of 1965. The achievement results of these tests were subjected to a statistical technique known as analysis of covariance. The statistical test was carried out on the IBM 7040 Computer at the Department of Computing Science, University of Alberta.

The study did indicate that there were few significant differences in academic achievement which would favor either the Continuous Progress Plan or the Graded Program.

Statistical analysis of the test results indicated:

1. That the slow pupils in the seventh year of the Continuous Progress Plan scored significantly higher in the Iowa arithmetic problem solving test but showed no significant differences in all other achievement tests.

2. That when the boys and girls of the groups were segregated, the boys in the sixth year of the C.P.P. scored significantly higher in the Edmonton reading and science standardized tests than the boys in the Graded group. No significant differences were indicated in all other tests.

3. That when the boys and girls of the groups were segregated, the boys in the seventh year of the C.P.P. scored significantly higher in the Iowa arithmetic problem solving test than their counterparts in the Graded Program. No significant differences were indicated in all other tests.

4. That there were no significant differences in the results of the achievement tests between the groups of girls.

This research study was concerned only with academic achievement of slow pupils in two elementary programs and no attempt was made to measure or compare the personal and social development of the pupils.

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CHAPTER I

INTRODUCTION

The grade system of most schools on the North American Continent has been in existence for over a century. The rigidity or "lock-step" nature of the grade system has become a serious handicap to many pupils of varying academic abilities. Slow academic pupils and superior academic pupils have been constantly confronted with frustrations that are detrimental to their school progress. Recently, experimental plans have been introduced in school systems whereby pupils of varied academic abilities may progress through levels or units of work at different time intervals. One such experimental plan that has created considerable interest is the nongraded school. Goodlad and Anderson explain the purpose of the nongraded school by saying:

> The nongraded school is designed to implement a theory of continuous pupil progress: since the differences among children are great and since these differences cannot be substantially modified, school structure must facilitate the continuous educational progress of each pupil. Some pupils, therefore, will require a longer period of time than others for achieving certain learnings and attaining certain development levels.[1]

The nongraded structure differs from the graded structure in some very basic assumptions. In the nongraded structure a pupil may progress more rapidly during one school term and quite slowly in another. A pupil is permitted to progress rapidly in one area and more slowly in

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[1]J. I. Goodlad and R. H. Anderson, The Nongraded Elementary School (New York: Harcourt, Brace and Company, 1963), p. 52.

others. Slow progress is provided for by permitting a longer time to do given units of work without repetition of subject matter. Also, a flexible pupil movement is possible because a pupil may shift to another class at almost any time, or the transfer may be made on a quarterly or semester basis. The nongraded structure provides for vertical and horizontal movement whereas the graded structure encourages horizontal expansion only. The nongraded and graded structures may be visualized as the two extreme ends of a continuum, the one structure stressing the organizational flexibility so necessary for meeting the needs of individual differences and the other stressing the "lock-step" method of group instruction. Many recent elementary school plans may be placed at various positions within this continuum.

A plan that has attempted to overcome some of the rigidity of the grade system in the Edmonton Public School District is its Continuous Progress Plan. This plan was introduced on an experimental basis in the spring of 1957 at Parkallen School. Since 1962 all elementary schools in the city school system are operating at various stages under the Continuous Progress Plan.

At the completion of grade one, the pupils of the elementary program of the Edmonton Public School System are grouped on the basis of I.Q., achievement and the teacher's judgement. The elementary program consists of eighteen units of work. For the purpose of administering the program, all pupils are grouped into four homogeneous units: superior, high average, low average and slow. The superior group takes five years, the low average and high average groups take six years, and

the slow group takes seven years to complete the eighteen units of work. This Continuous Progress Plan provides for the acceleration or deceleration of pupils without causing them to skip or repeat units of work. Details of the Continuous Progress Plan may be found in the Third Draft of the Principals' and Teachers' Manual.[2]

Although there are undoubtedly many problems to be solved in the administration of this plan, personnel employed by the Edmonton Public School District feel that it is a step in the right direction. It is realized that this plan may not meet the needs of the widely varying interests and abilities of all elementary pupils, but it is hoped that it has presented advantages over the conventional grade system.

In the spring of 1964, R. S. Melnychuk completed a thesis that assessed the academic achievement of two categories of pupils in the Continuous Progress Plan. Average and accelerated pupils of this plan were matched with pupils of traditionally graded classes. Upon the completion of his study Melnychuk recommended that a further study be made to assess progress of the slow pupils in the seven-year program of the Continuous Progress Plan.[3] It is the purpose of this study to compare the achievement of "slow" pupils in the Continuous Progress Plan with that of "slow" pupils in the conventional graded program.

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[2]Edmonton Public School Board, The Edmonton Continuous Progress Plan: Principals' and Teachers' Manual. (Third Draft, 1964).

[3]R. S. Melnychuk, "Academic Achievement of Pupils in the Edmonton Continuous Progress Plan" (unpublished Master's thesis, The University of Alberta, Edmonton, 1964).

STATEMENT OF THE PROBLEM

The purpose of this study is to compare the academic achievement of two slow groups in the sixth and seventh years of the seven-year program (C.P.P.) with that of two groups of pupils in the fifth and sixth grades of the traditionally graded program who have repeated one grade of their elementary program.

NEED FOR THE STUDY

The Continuous Progress Plan began in one school of the Edmonton School District #7 in September 1957. By September 1964, all elementary schools had adopted the plan. Recent studies have questioned the practice of having some pupils repeat grades because of low academic achievement in the elementary school program. Whether the traditional practice should be abandoned depends in part upon the relative merits of other practices such as the Continuous Progress Plan.

The Edmonton Continuous Progress Plan places pupils of low academic achievement in a seven-year program. During the 1964-65 school term there were a sufficient number of pupils in the sixth and seventh year of the seven-year program, and a sufficient number of pupils in grades five and six of the Graded Program, who had repeated one grade, to warrant partial comparison of the effects of the two distinct practices upon pupils categorized as "slow."

DEFINITION OF TERMS

1. Seven-Year Program. Program of studies in the C.P.P.

covering the elementary curriculum in the period of seven years.

2. Slow Pupils. Pupils in the seven-year program. The symbol 6/7 is used to designate pupils in the sixth year of the seven-year program. The symbol 7/7 is used to designate pupils in the seventh year of the seven-year program.

3. Graded Program. Program of studies of the conventional system of grades.

4. Repeaters. Pupils who have repeated one grade in the graded program. The symbol 5R is used to designate pupils in the fifth grade who have repeated one grade. The symbol 6R is used to designate pupils in the sixth grade who have repeated one grade.

DELIMITATIONS

This study was restricted to the elementary grades of the Edmonton Public School System.

Data available from the 1965 Continuous Program Forms (C.P. 4) were used to indicate academic achievement of pupils in the sixth and seventh years of the seven-year program.

Data available from the 1965 Annual Report Sheets were used to indicate academic achievement of pupils in grades five and six of the Graded Program who had repeated one grade.

Achievement was defined as academic achievement measured by the Edmonton Public School Board tests in arithmetic, reading, science and social studies and by the Iowa Tests of Basic Skills in vocabulary, reading comprehension, language and arithmetic skills.

BASIC ASSUMPTIONS

The following assumptions were made:

1. That the Edmonton Public School Board standardized tests and the Iowa Tests accurately measured performance in each of the academic areas.

2. That teachers in the Continuous Progress Plan and Graded Program were comparable in qualifications and experience.

3. That data available from teachers were accurate.

4. That the Laycock and the Lorge-Thorndike Tests could be considered to be valid measuring instruments.

NULL HYPOTHESES

The following hypotheses will be tested in this study:

1. There is no significant difference in academic achievement between a group of pupils in the sixth year of the seven-year C.P.P. (6/7) and a group of pupils in the fifth grade of the Grade Program (5R) who have repeated one grade.

2. There is no significant difference in academic achievement between a group of pupils in the seventh year of the seven-year C.P.P. (7/7) and a group of pupils in the sixth grade of the Graded Program (6R) who have repeated one grade.

3. There is no significant difference in academic achievement between a group of boys in the sixth year of the seven-year C.P.P. (6/7) and a group of boys in the fifth grade of the Graded Program (5R) who have repeated one grade.

4. There is no significant difference in academic achievement between a group of girls in the sixth year of the seven-year C.P.P. (6/7) and a group of girls in the fifth grade of the Graded Program (5R) who have repeated one grade.

5. There is no significant difference in academic achievement between a group of boys in the seventh year of the seven-year C.P.P. (7/7) and a group of boys in the sixth grade of the Graded Program (6R) who have repeated one grade.

6. There is no significant difference in academic achievement between a group of girls in the seventh year of the seven-year C.P.P. (7/7) and a group of girls in the sixth grade of the Graded Program (6R) who have repeated one grade.

CHAPTER II

REVIEW OF THE LITERATURE

The literature in this chapter was selected on the basis of its relevancy to the prominent features of the Edmonton Continuous Progress Plan. A brief explanation of this plan was deemed necessary as a preamble to the related literature.

The Continuous Progress Plan, introduced in 1957 at Parkallen School, was an attempt to overcome the rigidity of the conventional grade system through the use of another system of grouping. To make the elementary program more flexible, the Edmonton Continuous Progress Plan divided the curriculum of the six elementary grades into eighteen units of work. This division applied chiefly to the skill subjects of reading, arithmetic and spelling. By 1962, all schools in the Edmonton Public School District were at various stages of the Continuous Progress Plan.

To implement the Continuous Progress Plan, a system of testing, classifying and assigning pupils to groups was devised. During the first year of the elementary program, all pupils were given the Detroit Beginners' First-Grade Intelligence Test. In March of the same school term, those pupils who showed a deviation from expected performance were given the Detroit Advanced First-Grade Intelligence Test. More recently, the Lorge-Thorndike Non-Verbal Test, Level Two, has been administered to first-grade pupils, as have Achievements tests in Word

Recognition and Paragraph Reading, Arithmetic and Spelling. The scores on the mental and achievement tests and the teachers' own experience and judgement were the important factors in determining the appropriate group for each pupil.

After the completion of grade one, pupils were allocated to four groups: superior, high average, low average and slow. The superior group of pupils were to complete four units of work in one school term, permitting them to complete the eighteen units of work in five years. Both the high average and the low average groups were to cover three units of work in one school term, requiring six years to complete the elementary program. The slow group were to complete the elementary program in seven years.

A statement in the Principals' and Teachers' Manual[4] reflects the judgements of officials of the Edmonton Public School Board after seven years of the plan's operation.

> The plan helps to reduce the wastage found in conventional grade systems where slower pupils are required to repeat work they have already covered.
>
> The plan permits the teacher to set realistic goals for the pupils which are within their ability to achieve.
>
> The plan enables the school to provide a more positive program for the slower pupils which will enable them to retain their self-respect and confidence.

Insofar as this study is concerned, the significant changes represented by the introduction of the Continuous Progress Plan were:

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[4]Edmonton Public School Board, The Edmonton Continuous Progress Plan: Principals' and Teachers' Manual (Third Draft, 1964).

(1) the gradual abandonment of the nonpromotion treatment of slow learners; and (2) the application of ability grouping as a means of accommodating slow learners.

Consequently, literature has been selected for reporting in this study on the basis of relevance to these features of change and to the Edmonton Continuous Progress Plan.

Nonpromotion

Jones[5] claimed that much of the literature published since 1940 indicates that a pupil should progress with his own age group. He contended that a pupil will, on the average, achieve more by being promoted than by being retained and that even the supporters of nonpromotion advocate nonpromotion only under the most extreme circumstances. He reported studies on the relationship between school drop-outs and retardation which showed that grade or subject failure is symptomatic of those who withdrew from school early. The progression of students with their fellows, year by year, was based on sound psychological principles, she said, and should not be considered as mere sentiment or "soft" pedagogy.

Kowitz and Armstrong[6] made a study on the effect of promotion policy on academic achievement using records of the Research Offices of the New York Education Department. They located two school districts

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[5]J. J. Jones, "Recent Trends in Promotional Theory," Progressive Education, XXXIII-XXXIV (January, 1956), 5-6.

[6]G. T. Kowitz and C. M. Armstrong, "The Effect of Promotion Policy on Academic Achievement," Elementary School Journal (May, 1961).

that had contrasting promotion policies. The findings of their study were that the school district with the policy of nonpromotion experienced a higher rate of achievement as measured by objective tests. Although this superior achievement was considered to be laudable, they said: "However, the school has a broader responsibility, and the warnings of mental hygienists on the effect that forced overachievement has on the personality development of the child must be recognized."[7]

Wrightstone[8] reported research which indicated that children at any ability level did not learn more by repeating a grade or unit of work. He stated that a study of children with low I.Q.'s showed that those who repeated several grades were not doing as well in school as comparable children who had been promoted each year.

Worth's[9] findings on the effect of promotion and nonpromotion on academic achievement of third and fourth grade pupils favored the promoted group in reading vocabulary, total reading and arithmetic fundamentals. His hypothesis that no significant difference existed between achievements of promoted and nonpromoted groups was supported in reading comprehension, word recognition, arithmetic reasoning, total arithmetic, language skills, spelling, total language and total achievement. He suggested that the inability of low-achievers to gain from

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[7] Ibid., p. 435.

[8] J. W. Wrightstone, "Class Organization for Instruction," National Education Association, Washington, D.C., XLVI (April, 1957), 254-55.

[9] W. H. Worth, "Promotion or Nonpromotion?" Educational Administration and Supervision, XLVI (January, 1960).

nonpromotion might be caused by lack of supplementary instructional materials adapted to the individual needs of this group. Also, he stated, the less stimulating challenge of repeating partially-learned material might be a cause of low-achievers not making the expected gains in achievement. He generalized that "individualization of instruction may well require the development and utilization of special curricula, methods and materials."[10] With regard to academic achievement Worth concluded by stating:

> Continued reliance upon nonpromotion in itself to improve school achievement is unwarranted. Low-achieving pupils who are nonpromoted appear to make no greater, and often less, gain in achievement than they do when promoted. If the practice of nonpromotion is to continue it must be justified on grounds other than improved achievement.[11]

Otto[12] interpreted research to indicate that promotion practices which threaten failure had no measurable effect on the achievement of those so threatened. Repetition of a grade or unit of work benefited about 20 per cent of those who repeated, made no measurable difference in the achievement of 40 per cent, and was harmful to about 40 per cent. He pointed out that, "High nonpromotion rates tend to lower the average of measured achievement and the level at which instruction is pitched in a school; low nonpromotion rates tend to have the opposite effect."[13]

Ability Grouping

The question may be asked: Does grouping by levels of academic

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[10] Ibid., p. 21. [11] Ibid., p. 24.

[12] H. J. Otto, "Grouping Pupils for Maximum Achievement," School Review, LXVII (Winter, 1959), 387-93.

[13] Ibid., p. 392.

ability make a difference in pupil learning? Some research studies conclude that ability grouping does foster a gain in scholastic achievement, while others reach contrary conclusions which favor heterogeneous grouping.

Those who maintain that grouping children according to ability is a logical approach to meeting individual differences rely on assumptions as suggested by Franseth:[14]

> That grouping children according to ability can actually be accomplished.
>
> That testing or measuring instruments can adequately measure a child's ability.
>
> That speed in learning is the most important characteristic of learning ability.

Franseth[15] also summarized the views of those who favor heterogeneous grouping as being:

> Available evidence seems not to support the assumption that learning takes place more effectively if the range of differences in pupil activity is materially reduced.
>
> The assumption is questionable that grouping children according to ability fosters the development of desirable attitudes and healthy self-concepts.

Educators agree, however, that any group of children will encompass a range of academic abilities and attainments, the range varying from one subject to another. It follows, therefore, that some children will need a longer period of time than others to achieve some

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[14]Jane Franseth, "Toward Effect Grouping," Association for Childhood Education International (Washington 16, D.C., 1962), pp. 28-31.

[15]Ibid.

of the goals of an elementary school program. The result of the dilemma is that although ability grouping is generally regarded as desirable in elementary school organization, there is no unanimous agreement as to what the ideal grouping structure should be within a school. Various plans have been devised to move children through the school program at their own rates without either skipping or repeating grades, but none has been judged universally to be the "ideal" way of meeting individual differences.

The views of Morrison-Cook illustrate the dichotomy of opinion on grouping. Cook[16] contended that the basic concern should be with differences among pupils rather than with attempts to eliminate differences through grouping. He stated: "Ability grouping is based on the hypothesis that the pupil varies little in achievement from subject to subject."[17] Rejecting the hypothesis, Cook indicated the central problem as being how best to meet within a group the needs of pupils who vary widely in academic ability. Cook[18] suggested that administration policies should be established to:

1. Make it possible for the teacher to know the pupil well enough to meet his needs.

2. Provide instructional material with a range of difficulty and interest appeal commensurate with the needs of the instructional group.

Cook's general judgement was as follows:

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[16]Walter W. Cook, "The Gifted and the Retarded in Historical Perspective," Phi Delta Kappan, XXXIX (March, 1958).

[17]Ibid., p. 252. [18]Ibid., p. 253.

> The harm resulting from homogeneous grouping is inherent in the assumption that the group is homogeneous and that instructional materials and procedures can be adjusted to the needs of the group as a whole that, in other words, a problem has been solved before it has been really understood. The obligation of the school to furnish instructional material with a range of difficulty commensurate with the range of ability in the group and to meet the individual needs of pupils is just as great when ability grouping is practiced as when it is not.[19]

The question may arise: What is the most practical and effective way to organize an elementary school or classroom to take care of individual differences? Morrison reported the following:

> It seems reasonable to conclude that the best grouping procedures are likely to differ from one school to another, the most desirable practice often being dependent upon such factors as: (1) the competence and maturity of the local staff, (2) the nature of the physical plant, (3) school size, (4) class size, (5) the local curriculum or design of instruction and (6) a highly intangible quality--the intensity of the desire of a teacher or a group of teachers to make a particular plan work effectively. The philosophy and ability of the able teacher are undoubtedly more important than any grouping plan, however ingenious it may be with respect to creating good environments for teaching and learning.[20]

The Slow Learner

In a large school system, the likelihood is that about 18 per cent of the population are within the I.Q. range of approximately 80 to 95. These pupils, called "slow learners," tend to experience considerable failure and retardation. Their rate of intellectual growth is between three-fourths and nine-tenths that of the average child. In many school systems, slow learners have at best been tolerated and often

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[19]Walter W. Cook, "Grouping and Promotion in the Elementary School," University of Minnesota Press, 1941, p. 33.

[20]Nellie C. Morrison, "Instead of Ability Grouping--What?" Childhood Education (April, 1960), 371.

little has been done to accommodate them.

It is generally agreed that slow learners are capable of being effectively educated. Chidley[21] described the following intellectual characteristics of slow learners:

1. They have not the same mastery of previous learning and consequently need more review and much repetition.

2. Their interest span is shorter and they need smaller units of work.

3. They cannot retain many things at a time.

4. They do not comprehend or see clearly the significance of things.

5. They cannot see analogies or make mental associations very well.

6. They have difficulty organizing ideas and facts.

7. They do not transfer ability from one situation to another.

8. Their general interests are not as wide or varied.

9. They lack initiative, cannot direct their own activities or detect and correct their errors.

Chidley claimed that slow learners could not learn their academic skills at the chronological age at which average children learned them; in the teaching of reading, for example, a minimum mental age of six years was necessary for an average pupil to experience success in learning to read. Research indicated, he said, that a slow learner with an I.Q. of 80 did not have a mental age of six years until he was seven years, six months old. A slow learner with an I.Q. of 90 had a mental

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[21]N. Chidley, "Special Education for the Slow Learner," Canadian Educational Research Journal, III:3 (September, 1963), 206.

age of six years when he was six years, eight months old. Although the slow learner would be capable of learning many of the academic skills when he was older, there were some skills which would never be acquired because the necessary mental growth would never be attained.

Despite the fact that psychologists have stressed the characteristics and needs of the individual, curricula are still planned for the "normal" group only. Chidley suggested a further handicap:

> The common practice is to adapt the general education curricula to the requirements of the middle socio-economic class. In view of the fact that pupils in this category come predominately from the culturally disadvantaged low socio-economic areas of the community, this type of curricula has little value or meaning to many of them. This environmental factor plus their limited intellectual ability adds to the problem. It is interesting to note that slow learners from a middle-class culture get along fairly well in the middle-class oriented curriculum or program.[22]

The educational program planned for the slow learner must begin as soon as he enters school. A common practice for identifying a slow learner, however, involves the use of individual intelligence tests, group intelligence tests, information from cumulative records, and information attained from achievement tests, all administered during the first year of school. Some educators suggest that slow learners can and should be identified in kindergarten.

Featherstone[23] cautioned that there was no fixed level of ability at which a pupil must be called a slow learner. Usually, he stated, pupils in the slow learning category were those who had I.Q. ratings

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[22] Ibid., p. 208.

[23] W. B. Featherstone, Teaching the Slow Learner (Columbia University, Bureau of Publications, 1951).

below 91 and above 74, with an average of about 85. He firmly suggested that the term "slow learner" should be interpreted consistently to mean slow in abstract learning. The slow learner, he said, experienced difficulty in defining, distinguishing and analyzing which requires reasoning ability. It was this lack of reasoning that made him slow.

Featherstone summarized his statements by saying:

> The slow learner is a person very much like the rest of humanity. He is not a "type" but rather a variant of one type. He has more or less of the common characteristics of all other pupils in school--the same basic needs, the same ways of learning and about the same amount of variability and uneveness of abilities and other resources. Being by definition somewhat less intellectual he does not reason or learn to manage abstractions and symbols as well as the average. In most other respects, it is very difficult to tell the difference between the average child and a slow learner. Very few of the important differences can be discerned by the eye. Much more must be known before one can properly conclude that any individual is a slow learner.[24]

Grouping Slow Learners

The consensus among many educators is that ability grouping tends to show advantages for the group that is low in academic achievement. Students of child development have found that children learn best in situations where they can experience success. Among the basic needs of children is the need for a feeling of achievement and personal worth. Slow pupils, as well as accelerated and average pupils, must have this need satisfied. They must be in an atmosphere that is devoid of the inhibiting fear of failure so that learning is enhanced.

Daniels[25] made an investigation of the opinions of 173 primary

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[24] Ibid., p. 11.

[25] J. C. Daniels, "The Effects of Streaming in the Primary School," British Journal of Educational Psychology, XXXI-XXXII (1961).

school teachers in England, concerning pupil streaming procedures. One of the major conclusions from this study was that a large majority of teachers believed that slow pupils made the best progress scholastically when taught in classes of children with similar abilities and attainments, that is, as homogeneous groups. He said that many English teachers "are so concerned to help these duller C-class children that they are prepared to ensure that they are taught in small classes, even if this means increasing the sizes of A and B classes."[26]

Otto[27] held that ability grouping tended to show slight advantages for the group that was low in academic achievement. He stated, however, that there was inadequate evidence to appraise the values for objectives other than academic achievement.

The Four-Year Program in Division I of the Calgary Public School District is an attempt to provide slow learners with the opportunity to cover the first three years of the elementary program in four years without repeating any portion of the curriculum. Gillespie's[28] study revealed that when a group of Four-Year pupils was matched with a group of repeaters in Division I, and tests in arithmetic, reading and spelling were given to these groups, no significant difference in performance was evident. However, the average pupils in the Three-Year Group scored significantly higher in all subjects when the results of their tests

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[26]Ibid., p. 77.

[27]H. J. Otto, "Grouping Pupils for Maximum Achievement," School Review, LXVII (Winter, 1959), 387-93.

[28]Earl M. Gillespie, "An Evaluation of the Four Year Program in Division I as Followed by the Calgary Public Schools" (unpublished Master's thesis, University of Alberta, Edmonton, 1959).

were compared with those of the Four-Year Group.

Gillespie concluded that:

> The fact that there was no significant difference in achievement in arithmetic, reading or spelling appears to indicate that the Four Year Program is not superior to repetition of a grade. Before accepting this as true, further study should be made to discover if the program is being adversely influenced by some unknown factor, or factors. There is a possibility that the program is not operating as it was meant to operate. In some instances, a very small group of Four Year pupils is found in a large class of Three Year pupils. Teachers can forget the aims and techniques of the program and can allow the larger group to dominate. There is always a danger that the Four Year Group may be made to adapt itself to the course followed by the other group.[29]

West[30] undertook a research study in two Dade County Schools in Miami, Florida. One of these schools had a triple-track organization in which slow, average and rapid learners were assigned to separate class groups. The other school organized classes on a heterogeneous basis. The study revealed:

> That the scholastic achievement of the pupils assigned to classes for slow learners in the triple-track school was more advanced than the achievement of the slow-learning pupils in the other school. However, the attitudes toward themselves and toward other people expressed by the children in the slow group in the triple-track school was much more negative than those of the slow learners in the other school.[31]

The study seemed to indicate that some type of school organization for grouping slow pupils is needed, which would foster desirable personal attitudes and, at the same time, be conducive to their higher scholastic achievement. West[32] suggested that the type of school organization

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[29] Ibid., p. 48.

[30] J. West, "Grouping Slow Learners," Education, LXXXI:6.

[31] Ibid., p. 345. [32] Ibid., p. 247.

required for slow learners should be one which:

1. Groups the slow learners for part of a school day for specialized instruction in the areas of need.

2. Is flexible enough in organization that permanent identification with the group is not imminent.

3. Is closely co-ordinated with the rest of the school program.

4. Encourages improvement of pupils' attitudes and achievement.

In most school systems achievement results from Intelligence Tests are used as the criterion for segregating slow pupils. Ingram[33] stated, however, that there were many pupils with I.Q.'s between 70 and 80 who could succeed fairly well in academic work in a flexible grade organization or in a small grade group where the academic work was individualized.

It is generally agreed that slow achievers should be permitted to progress at their own rate and that they should receive achievement ratings on the basis of their ability to succeed. Their progress should be continuous, even though they may remain in the same class longer than a year, and there should be no periods of failure.

Ingram suggested that:

> If the development of the slow-learning child is to be continuous and sure, a carefully conceived, integrated program that promotes mastery of competences must be in effect from the time of school entrance to the time of leaving. His progress from one class to another--in city communities, from pre-adolescent to adolescent groups--should be viewed as continuous, developing program without overlapping or gaps. There should be a definite sequence and progress--careful articulation from group to group and from year to year. In such a program, the need for evaluation of progress or growth is evident.[34]

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[33]Christine P. Ingram, Education of the Slow-Learning Child (New York: The Ronald Press Company, 1960).

[34]Ibid., p. 120.

Should slow learners be grouped by themselves in separate classrooms, or should they be mixed in with other children of the same age group? Featherstone[35] felt that there was much to be said both for and against separate grouping of slow learners. He stated that mere separation without far-reaching reconstruction of the curriculum would accomplish little for the slow pupils. On the other hand, leaving slow learners in mixed groups will not ease their burden or prevent experiences of inadequacy and inferiority.

In the final analysis, each school must size up its total situation and decide whether or not grouping is feasible. Featherstone[36] presented a number of questions that should be considered:

> Do the principles of democracy preclude separate groups in spite of other conditions?
>
> Can you group separately, even if you wish to?
>
> Are there teachers available who are prepared to do what needs to be done for the separated groups of slow learners?
>
> Are there official regulations or unofficial and general community feelings and prejudices that make a policy of separate grouping doubtful wisdom?
>
> Can you reasonably avoid the risks of exaggerating the importance of slow-learningness as well as the tendency of separate classes to become catchalls for all kinds of misfits?

Featherstone[37] also presented questions with regard to critical points in not grouping separately:

> Is it possible to make the kinds of adjustments that are needed if slow pupils are to be well provided for in mixed classes?

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[35]W. B. Featherstone, Teaching the Slow Learner (New York: Columbia University, Bureau of Publications, 1951).

[36]Ibid., pp. 24-25. [37]Ibid., pp. 27-28.

> Are the teachers willing and able to accept at face value a different kind and quality of participation from different pupils?
>
> Is the school as a whole, or the individual teacher, able to devise and manage a scheme of controlling promotion and progress, and of making reports to parents that avoid exaggerated competition and persistent failure for the slow learners?
>
> Are the special materials and other resources essential for slow learners available in sufficient quantity?
>
> Can activities outside the school be arranged for all pupils as frequently as is necessary for the slow learner?

Various methods have been used by school systems in the placement of slow pupils, among which are: (1) retention in a grade until academic proficiency has been established; (2) placement in special classes; (3) promotion of those who have been grouped homogeneously; and (4) regular class placement with social promotion.

Johnson[38] asserted that the most common placement of slow pupils was in self-contained special classes. He stated that slow learners retained in an average class containing younger normally intelligent pupils became frustrated and discouraged when they were unable to perform at the same academic level as their younger classmates. He added, however, that placing slow pupils in special classes tended to deprive them of many opportunities that arose during the normal school day and which were essential to their education. On the matter of curriculum, Johnson said:

> Traditionally the programs for the slow classes have been revisions, adaptions, or watered-down versions of those found in the regular classrooms. The general content remains the same, offered

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[38]G. O. Johnson, Education for the Slow Learners (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963).

at somewhat slower pace and in somewhat less detail.[39]

He went on to say that:

> The frustrations, the failures and the lack of a constructive curriculum are factors the children too often must face. Many teachers continue to emphasize practice in academic skill beyond the children's ability to comprehend. When the children are surrounded by adverse attitudes plus a curriculum that provides them with few satisfactions and for which they can see little value, they come to resent and dislike the situation.[40]

According to Johnson, the elementary school should be organized so that regrouping of pupils will occur whenever the children in one group show such a lack of development that they no longer derive benefit from the instruction provided. Later, they should be grouped on their reading ability. Still later, grouping must also be based upon arithmetic skills as well as reading. A given pupil, therefore, might be placed with one group for reading instruction and with another for arithmetic. Grouping, he said, should be based upon the individual's ability to cope with a particular subject.

A portion of the literature which deals with the grouping of slow learners, indicated, therefore, that in the organization of elementary schools consideration must be given to the possibility of grouping according to the pupils' ability in individual subject skills.

Studies of the Edmonton Continuous Progress Plan

In April, 1963 Green[41] completed a thesis which investigated the accuracy of techniques used in the Edmonton Continuous Progress Plan to

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[39]Ibid. [40]Ibid.

[41]David P. Green, "An Evaluation of Methods Used for Programme Assignment in Edmonton's Continuous Progress Plan" (unpublished Master's thesis, University of Alberta, Edmonton, 1963).

assign pupils to groups. The intent of grouping, he suggested, was to organize pupils homogeneously so that instruction could be adapted to the needs of each group. To appraise the suitability of groupings, Green administered mathematics, reading, science and writing tests. He found that significant differences existed between the superior and high average groups, except in reading, during the fourth, fifth and sixth years. Significant differences in all subjects existed at the fourth and fifth years between the two average groups. Comparing the achievement of the low average and slow groups, he found that performances were significantly different in all subjects at the fourth year level. However, no significant differences were found between these two groups at the fifth year in any of the skill subjects. Green suggested that:

> As average and slow learning groups progressed in the fifth and sixth years, differentiation of instruction with the groups that had been established ceased to produce differences in performances. This trend of the merging of performances of the slow-moving and low average groups in the last two years of elementary school may have been influenced by factors not resolved in the study.[42]

Melnychuk's study[43] assessed and compared the academic achievement of pupils in the Edmonton Continuous Progress Plan with matched pupils in the conventional grade system. Melnychuk administered the Iowa Tests of Basic Skills and the Edmonton Public Schools achievement tests to these two groups of pupils. He found that there were no significant differences in academic achievement between the average group in the Continuous Progress Plan and the control group in the Graded Program. His study indicated that the superior pupils in the fifth grade of the

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[42] *Ibid.*, p. 118. [43] Melnychuk, *loc. cit.*

Graded Program scored significantly higher on three tests but showed no significant differences in four others when compared with superior pupils in the fourth year of the five-year program of the Continuous Progress Plan. In the sixth grade, superior pupils in the Graded Program scored significantly higher in two tests, but showed no significant differences in six others when compared with superior pupils in the fifth year of the five-year program of the Continuous Progress Plan. Melnychuk's thesis was concerned with an analysis of academic achievement of average and superior pupils of two elementary programs and he made no attempt to assess the academic achievement of pupils in the slow group of the Continuous Progress Plan.

In summary, Green's study investigated the accuracy of techniques used in the Edmonton Continuous Progress Plan to assign pupils to groups. Melnychuk, on the other hand, made a study to assess and to compare the academic achievement of superior and average pupils with matched pupils in the conventional graded system. To make an evaluation of the Edmonton Continuous Progress Plan more complete, a study was necessary which would assess and compare the academic achievement between groups of slow pupils of two existing elementary programs.

The writer of this study endeavored, therefore, to make a comparison of academic achievement between slow pupils in the Edmonton Continuous Progress Plan and pupils who repeated one grade in the conventional graded program. During the 1964-65 school term there were a sufficient number of designated slow pupils in the sixth and seventh year of the seven-year program of the Continuous Progress Plan, and a

sufficient number of pupils in grades five and six of the Graded Program who repeated one grade, to warrant an evaluation and comparison of the two elementary programs.

CHAPTER III

EXPERIMENTAL PROCEDURE

The purpose of this study was to compare the academic achievement of two slow groups in the sixth and seventh years of the seven-year program of the Continuous Progress Plan with that of two groups of pupils in the fifth and sixth grades of the traditionally Graded Program who repeated one grade during their elementary programs.

SELECTION PROCEDURE

Four groups of pupils, two experimental groups and two control groups were selected for this study.

An experimental group of 57 slow pupils, which consisted of all the pupils in the sixth year of the seven-year program (6/7) of the Edmonton Public School's Continuous Progress Plan, was selected. A corresponding control group of 100 pupils was selected from schools which were still operating a portion of their elementary program under the traditionally Graded System. This sample control group (5R) consisted of grade five pupils who repeated one grade in the elementary program.

Another experimental group of 35 slow pupils which consisted of all the pupils in the seventh year of the seven-year program (7/7) was selected. A sample group of 75 grade six pupils of the Graded Program who repeated one grade (6R) was selected as the corresponding control group.

SOURCES OF DATA

Information regarding age, sex, Intelligent Quotient and occupation of father was obtained from the cumulative records of each pupil. The Iowa Tests of Basic Skills and the Edmonton Public School's Elementary Standardized Tests were used to determine academic achievement.

TYPES OF DATA REQUIRED

Two general types of data were used in this study: (1) those used as control variables; and (2) those used as measures of achievement.

Information which represented control variables were: (1) the ages in months of the pupils, taken from school records; (2) the intelligence of the subjects as measured by the Lorge-Thorndike Intelligence Test, Level 3, and the Laycock Mental Ability Test; (3) indications of the occupations of the subjects' fathers, classified on the Occupational Class Scale as constructed by Bernard R. Blishen.

The instruments used to yield measures of achievement were: (1) The Iowa Tests of Basic Skills, (a) vocabulary, (b) reading, (c) spelling, (d) capitalization, (e) punctuation, (f) language usage, and (g) arithmetic; (2) the following Edmonton Public Schools' Elementary Tests: (a) the California Reading Test, Elementary, Form B.B., Grades 4 and 5, (b) the Van Wagenen Unit Scale of Attainment Reading Comprehension Tests, Grades 4 and 6, (c) Seeing Through Arithmetic Tests, Scott Forman Series, (d) the Elementary Science Tests, Edmonton Public Schools, and (e) The Social Studies Test, Edmonton Public Schools.

DESCRIPTION OF THE INSTRUMENTS

Age

The ages of the pupils in the experimental and control groups were taken from the cumulative records found in the office files of the elementary schools.

The Lorge-Thorndike Intelligence Tests

The Lorge-Thorndike Intelligence Tests are group tests and they are divided into two parts--Verbal and Nonverbal. The tests are available in five levels. Each level has two equivalent forms--Form A and Form B. This makes it possible to retest pupils whose scores on one testing seem questionable for any reason.

The Verbal Battery is made up of subtests which use only verbal items. They provide an index of scholastic aptitude. This battery correlates quite highly with three well-known group tests of intelligence, with coefficients of .77, .79, and .84.[44]

The Nonverbal Battery uses items which are either pictorial or numerical and does not predict school achievement quite as well as scores from the Verbal Battery. However, it does give an estimate of scholastic aptitude which has not been influenced by any lack of ability to read. When this was correlated with three older tests, the coefficients were .65, .71, and .74.[45]

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[44]Irving Lorge and Robert L. Thorndike, "The Lorge-Thorndike Intelligence Tests," Examiner's Manual (Boston: Houghton Mifflin Company, 1957), p. 14

[45]Ibid.

Laycock Mental Ability Test

The Laycock Mental Ability Test was given to a random sample of 7,500 pupils from grades 4 to 8 and the results were correlated with average academic marks of this random group. The median correlation coefficient was .59.[46]

When the results of this test were compared with various mental ability tests the following correlation coefficients were recorded.[47] (a) The Terman Group Test of Mental Ability, a correlation of .78 for 38 pupils in grade 8; (b) The National Intelligence Test, a correlation of .80 for 37 pupils in grade 7; (c) The National Intelligence Test, a correlation of .90 for 28 pupils in grade 8; and (d) The Otis Self Administering Test of Mental Ability, a correlation of .81 for 24 grade 5 pupils.

Occupational Class Scale

To classify the socio-economic status of the father of each pupil, the Canadian Occupational Scale, constructed by Blishen[48] was used in this study. In constructing this scale, Blishen determined the average income and the average number of years of formal education from data taken from the decennial census of 1951. He computed the standard scores of these two measures and then ranked each occupation accordingly. A correlation of .94 was computed between a study carried out in the

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[46] S. R. Laycock, Laycock Mental Ability Test (Saskatoon: University of Saskatchewan Bookstore,), p. 7.

[47] Ibid., p. 8.

[48] Bernard R. Blishen, "The Construction and Use of an Occupational Class Scale," Canadian Society, Bernard R. Blishen, Kaspar D. Naegele, and John Porter (eds.) (Toronto: The Macmillan Company, 1961), p. 478.

United States by the National Research Centre and the Blishen Scale.

The Iowa Tests of Basic Skills

The Iowa Tests are devised to test the functional skills of pupils in grades three to nine. Tests in vocabulary, reading comprehension, language skills, work-study skills and arithmetic skills are contained in the booklets.

Information regarding reliability and validity of the Iowa tests may be found in Appendix A.

Herrick contended that the strength of the Iowa Tests of Basic Skills "is in their circular validity, careful construction, provision of adequate norms based on a national sample, and high reliabilities."[49] Of major importance, he claimed, was the assistance the teacher received in the use of the teacher manuals:

> The manuals provide the teacher with excellent help in using test results to improve instruction. These advantages outweigh the disadvantages of length and time for administration. The tests for their purposes are among the best available at this time.[50]

C. A. V. Morgan recommended the Iowa Battery for use by any school system. He pointed out that the "Iowa tests were very well constructed and standardized with an excellent background in fundamental research and understanding of educational aims."[51]

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[49]V. E. Herrick, "Iowa Tests of Basic Skills," The Fifth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1959), pp. 30-34.

[50]Ibid., p. 31.

[51]C. A. V. Morgan, "Iowa Tests of Basic Skills," The Fifth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1959), pp. 34-36.

H. H. Remmers evaluated the Iowa Tests of Basic Skills by stating that "no battery of achievement tests intended for civilian use has been constructed with greater technical sophistication, greater adequacy of statistical base and greater use of previous research."[52]

L. Siegal recommended that the Iowa battery of tests should be brought to the attention of administrators of elementary schools. He reported that:

> When the Iowa tests are considered with respect to statistical characteristics and thoroughness of the research leading up to the final publication, it is obvious that this battery was not published prematurely. The authors' thoughtful consideration of matters of format was matched by their careful attention to the details of test development.[53]

Vocabulary test. This test gives approximately equal representation to nouns, verbs, and adjectives with a few adverbs at each grade level. The Manual states that:

> It is not the purpose of a single item in a test of this type to determine whether the pupil knows the meaning of a single word (the stimulus word) only. Nor is it necessary that the response words be easier than the stimulus word. Rather, the immediate purpose of each item is to determine if the pupil knows the meaning of all words used in the item. Thus, a 40-item vocabulary test may sample as many as two hundred words from his general vocabulary instead of only 40.[54]

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[52]H. H. Remmers, "Iowa Tests of Basic Skills," The Fifth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1959), p. 37.

[53]L. Siegal, "Iowa Tests of Basic Skills," The Fifth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1959), p. 37.

[54]University of Iowa, Manual for Administrators, Supervisors and Counselors, Iowa Tests of Basic Skills (Boston: Houghton Mifflin Company, 1956), pp. 71-72.

Reading comprehension test. The selections of this test vary in length from a few sentences to a full page. The passages were chosen from all of the types of material encountered by the pupil in everyday reading. They were adapted from a wide variety of sources: newspapers, magazines, encyclopedias, government publications and textbooks. From the third grade on, the items place a premium on understanding and drawing inferences from the reading selections. The testing objectives are:

> To recognize and understand stated or implied factual details and relationships.
>
> To develop skill in discerning the purpose or main idea of a paragraph or selection.
>
> To develop ability to organize ideas.
>
> To develop skill in evaluating what is read.[55]

Language skills tests. Spelling, capitalization, punctuation and usage are the four tests included in the Iowa Tests. The basic type of item employed in all four tests may be described as the "find-the-error" type. Also multiple-choice items are used in which the pupil must decide which one of a set of alternatives is correct for a given situation.

In the spelling test the items consist of four words, one of which may be misspelled. The pupil is to identify the misspelled word. A fifth response, "No Mistakes," is included in each item.

The items in the capitalization and punctuation tests are similar

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[55] Ibid., p. 56.

in format. They include one or two sentences extending over three lines of approximately equal length. The pupil is instructed to identify the line which contains an error or to effect a fourth response, indicating a total absence of errors.

The language usage test consists of items that have three sentences, one of which may contain a usage error. The pupil is to identify that sentence which contains the error or select the fourth response, "No Mistakes," if he thinks all three sentences are correct.[56]

Arithmetic skills tests. The total arithmetic test is divided into two half-hour units which test knowledge of concepts and skill in problem solving.[57]

In the test measuring arithmetic concepts, the emphasis is on understanding the number system, of terms, processes and operations, and of units of measurement. In the test on problem solving, competence is tested in a functional setting in problems which have been chosen to be challenging and practical. The fundamental operations and concepts involved in the problems for a particular grade are those generally presented prior to the end of that grade in most recently published textbook series in widespread use.

The Edmonton Public School Board Tests

The Edmonton Public School Board Tests are administered at the end of each school term to enable the teacher to compare the achievement

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[56]Ibid., pp. 57-64. [57]Ibid., pp. 67-70.

results of her class with the city-wide averages or norm.

The tests in arithmetic and reading were selected because they compare favorably with the Iowa arithmetic and reading comprehension tests. The Edmonton tests in social studies and science measure grasp of content while the Iowa tests measure the basic intellectual skills. A prominent factor in selecting these tests was their availability in all schools.

The California reading test. Each form of the California reading test is divided into two parts: Reading Vocabulary and Reading Comprehension. The Reading Vocabulary section is divided into three parts which test word form, word recognition, meaning of opposites and meaning of similarities. The Reading Comprehension section tests the pupils ability in following directions, his familiarity with the skills needed for reference and library research and his skill in the interpretation of meanings.

Flanagan[58] stated that the items on any reading test should discriminate between individuals with respect to their knowledge of vocabulary and ability to comprehend what they read. He concluded his review by saying:

> Although the test user might wish for somewhat more precise technical information regarding the test, it is the reviewers opinion that he will find the California Reading Test a valuable tool in appraising the progress of pupils with respect to these important skills of vocabulary and reading comprehension.[59]

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[58]J. C. Flanagan, "California Reading Test," Fourth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1953).

[59]Ibid., p. 568.

Hobson[60] acclaimed the test as being well thought-out and deserving of wide use. He considered the following as strong features in the test:

1. Test materials are representation of material encountered in every day school work.

2. The reading skills measured are among the most important ones we strive to develop.

3. Manual and scoring system are practical and effective.

Features that weaken the test are:

1. Almost total absence of proof of validity.

2. Tries to cover too wide a grade range.

3. Lack of suggestions as to what to do about class weaknesses disclosed by analysis.

Information regarding reliability and validity of the California Reading Test may be found in Appendix A.

Van Wagenen Unit Scale reading test. For each pupil there is a forty-five minute period allotted to complete the test. An attempt is made to measure maximum power of silent reading comprehension with no regard given to the speed of reading. The test is meant to examine the following aspects of comprehension:

1. Ability to identify the general sense of the paragraph.

2. Ability to identify pertinent details in a paragraph.

3. Ability to make simple inferences from the material presented in the paragraph.

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[60] J. R. Hobson, "California Reading Test," Fourth Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: The Gryphon Press, 1953).

Rapid scoring of the tests is possible because of the multiple choice technique employed.

Booker[61] stated that there were a few items that could be improved in this reading test, such as: unwarranted inferences, re-editing of the tests with reference to spacing and arrangement, and the lack of continuity in progressive comprehension difficulty.

Wrightstone[62] made the following criticisms:

> The test user who expects this series to provide a measure of such aspects of reading comprehension as reading to understand directions, to predict the outcome of events, to summarize ideas, or to apply these ideas to the solution of a problem, will be disappointed. The author presents no evidence of the validity procedures for these tests, except in general statements in the manual. These reading comprehension tests are valuable for survey purposes but do not seem to be especially valuable for diagnostic purposes.

He pointed out, however, that most other reading comprehension tests, if not all, deserved the same criticisms that were made against this test.

Seeing Through Arithmetic tests. The Seeing Through Arithmetic Textbooks for grades four, five and six are published by the Scott, Foreman and Company. The tests for this series consist of multiple-choice questions which are designed to examine all aspects of pupils' competence in arithmetic. Each test has six parts. Parts 1, 3 and 4

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[61]Ivan A. Booker, "Unit Scales of Attainment in Reading," The Nineteen Forty Mental Measurements Yearbook, Oscar K. Buros (ed.) (New Jersey: Highland Park, 1941), pp. 377-78.

[62]J. Wayne Wrightstone, "Unit Scales of Attainment in Reading," The Nineteen Forty Mental Measurements Yearbook, Oscar K. Buros (New Jersey: Highland Park, 1941), pp. 378-79.

are concerned with problem solving. Part 2 deals with computation, Part 5 with arithmetic information and Part 6 with basic concepts.

Elementary science tests. An Edmonton Public School Science Committee, under the chairmanship of N. E. Lougheed, organized and published science tests to cover the content of Science Bulletin 26. Separate tests, made up of multiple-choice questions were prepared for grades four, five and six.

To achieve some degree of validity, the committee attempted to ensure that each question of the tests was related to the curriculum, and it placed considerable reliance on the judgement of the most experienced teachers. To date no test of reliability has been administered.

Edmonton social studies tests. A Social Studies Committee, under N. H. Cuthbertson, developed a series of Social Studies tests. These tests were designed to cover the content of Bulletin 2, 1952.

Each test is divided into two parts. Part I is based on the theme "People Around the World" while Part II is based on the theme, "Canadian Heritage."

An item analysis was carried out and the advice of social studies teachers was obtained. The test was administered to random samples of pupils throughout the city system in grades four, five and six.

Percentile ranks and median scores were developed in 1956 on the performance of 2,310 grade six pupils.

COLLECTION OF DATA

In April, 1965, the writer investigated the academic achievement files at the central office of the Edmonton Public School System to identify pupils in the slow group of the C.P.P., and pupils who had repeated one year in the Graded Program.

During the month of May, 1965, the writer visited 41 elementary schools to gather information from cumulative records regarding the age, Intelligent Quotient and occupation of father, of each of the identified pupils.

Administration of the Iowa Tests of Basic Skills

Approximately 300 booklets were available from the Edmonton Public School Board and the Alberta Department of Education. The test booklets and answer sheets were delivered to the schools in June, 1965.

Tests were administered by principals, teachers, interns, and the writer of this study. The test answer sheets were collected and marked by the writer.

Administration of the E.P.S.B. Tests

These tests were administered by classroom teachers during the latter part of June, 1965. The classroom teachers marked the tests and recorded the raw scores.

TREATMENT OF THE DATA

Each pupil in the experimental and control groups was given a pupil code number, a group number and a sex number. These code numbers,

the I.Q. score, the Blishen score and the raw scores of the achievement tests of each pupil were then punched on an I.B.M. card.

To provide a means of attaining a measure of control of individual differences, the statistical technique known as Analysis of Covariance was used in this study. The analytical process was carried out by the I.B.M. 7040 Computer, of the Department of Computing Science, University of Alberta.

The Analysis of Covariance was used to test Null Hypotheses I to VI. The tables relating to the testing of these hypotheses include both the unadjusted and adjusted means of the criteria or dependent variables. The dependent variables include the means of the raw scores in vocabulary, reading, language skills and arithmetic of the Iowa Tests of Basic Skills and the achievement scores of the Standardized Tests of the Edmonton Public School System in reading, arithmetic, science, and social studies, before and after adjustment for differences in the control or independent variables. The independent variables included age, I.Q., and socio-economic status of the father of each of the pupils in the control and experimental groups.

The tables also include the source of variance, that is, the "between" group and "within" group variance, the degrees of freedom, the mean square, the adjusted F, and the probability or level of significance of the F value. The "F" is the ratio of the mean square for "between" group to the mean square for the "within" group variance.

CHAPTER IV

ANALYSIS OF DATA AND SUMMARY OF FINDINGS

This chapter analyzes the data from the testing of 87 pupils in the sixth and seventh years of the seven-year program of the Edmonton C.P.P., and from the testing of 176 pupils in grades 5 and 6 of the Graded Program who repeated one grade in their elementary school program. The twelve tables included in this chapter record information concerning the testing of six null hypotheses.

HYPOTHESIS I

> There is no significant difference in academic achievement between a group of pupils in the sixth year of the seven-year C.P.P. (6/7) and a group of pupils in the fifth grade of the Graded Program (5R) who have repeated one grade.

Results

To indicate a significant difference in achievement between the (6/7) group of the C.P.P. and the (5R) group of the Graded Program an F-value of 3.91 at the .05 level and an F-value of 6.81 at the .01 level of confidence would be required. An examination of Tables I and II on the following pages indicates no significant differences in achievement.

Discussion

Although the adjusted means indicate a significant difference in the Iowa Reading test and the California Reading test in favor of the C.P.P. group, the observed F-ratios of 3.51 and 3.17 failed to reach

TABLE I

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE IOWA TESTS OF BASIC SKILLS

	Unadjusted Means		Adjusted Means		Adjusted Analysis of Variance				
Subject	Control N = 100	Exp. N = 54	Control	Exp.	Source	DF	MS	Adjusted F *	Prob.
Vocabulary	22.8	25.8	23.1	25.1	Group	1	128.1	2.93	.08861
					Within	148	43.6		
Reading	34.0	38.0	34.4	37.2	Group	1	259.0	3.51	.06295
					Within	148	73.8		
Arithmetic Concepts	23.5	25.8	23.8	25.4	Group	1	90.1	2.26	.13409
					Within	148	40.1		
Arithmetic Problem Solving	13.4	13.1	13.4	13.2	Group	1	1.0	.05	.81795
					Within	148	19.8		
Total Arithmetic	37.0	39.0	37.2	38.6	Group	1	62.8	.71	.39994
					Within	148	88.1		
Spelling	22.0	22.7	22.3	22.2	Group	1	.3	.00	.94490
					Within	148	60.4		
Capitalization	19.0	17.6	19.0	17.5	Group	1	62.8	1.78	.18336
					Within	148	35.1		
Punctuation	14.7	15.6	14.7	15.6	Group	1	24.6	1.40	.24444
					Within	148	18.6		

* Required for significance with 1/148 df at the .05 level and an F of 3.91.
Required for significance with 1/148 df at the .01 level and an F of 6.81.

TABLE I (Continued)

Subject	Unadjusted Means		Adjusted Means		Adjusted Analysis of Variance				
	Control N = 100	Exp. N = 54	Control	Exp.	Source	DF	MS	Adjusted F *	Prob.
Usage	14.9	14.5	15.1	14.1	Group	1	30.4	1.61	.20581
					Within	148	18.8		
Total Language	70.1	70.7	70.6	70.0	Group	1	28.6	.11	.39994
					Within	148	26.4		

* Required for significance with 1/148 df at the .05 level and an F of 3.91.
Required for significance with 1/148 df at the .01 level and an F of 6.81.

TABLE II

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

Subject	Unadjusted Means Control = 100	Unadjusted Means Exp. = 54	Adjusted Means Control	Adjusted Means Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Reading	97.3	102.1	98.1	101.0	Group	1	333.1	3.17	.07673
					Within	148	192.0		
Arithmetic S.T.A.	53.7	53.5	54.1	53.1	Group	1	55.4	.42	.51616
					Within	148	131.5		
Science	49.1	55.1	50.1	53.5	Group	1	434.0	2.87	.09212
					Within	148	151.1		

* Required for significance with 1/148 df at the .05 level and an F of 3.91.
Required for significance with 1/148 df at the .01 level and an F of 6.81.

the critical value of 3.91 required for significance at the .05 level of confidence.

Conclusion

Null H_1, regarding no significant difference in achievement must be accepted.

HYPOTHESIS II

There is no significant difference in academic achievement between a group of pupils in the seventh year of the seven-year C.P.P. (7/7) and a group of pupils in the sixth grade of the Graded Program (6R) who have repeated one grade.

Results

The required F-ratio for significance between the (7/7) and (6R) groups with 1 and 104 degrees of freedom was an F-value of 3.94 at the .05 level and 6.94 at the .01 level of confidence. Table III shows a significant difference in arithmetic problem solving of the Iowa Test at the .05 and .01 levels of confidence in favor of the C.P.P. group (7/7). Table IV reveals that there are no significant differences in the Edmonton standardized tests.

Discussion

Although the F-value of 3.48 in the Iowa language usage test is an approach to a significant difference, it fails to reach the critical F-ratio of 3.94. With the exception of the Iowa arithmetic problem solving test and the language usage test, the achievement of the C.P.P. group and the Graded group are almost identical.

TABLE III

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL (6R) AND EXPERIMENTAL (7/7) GROUPS FOR THE IOWA TESTS OF BASIC SKILLS

Subject	Unadjusted Means Control N=76	Exp.N=33	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F	*Prob.
Vocabulary	23.5	24.1	23.7	23.7	Group	1	.03	.00	.98216
					Within	104	57.4		
Reading	33.0	35.1	33.0	35.0	Group	1	94.7	1.01	.29617
					Within	104	86.1		
Arithmetic Concepts	23.1	23.0	23.2	23.0	Group	1	2.5	.06	.79980
					Within	104	38.5		
Arithmetic Problem Solving	12.1	14.7	12.2	14.6	Group	1	128.5	7.42[b]	.00754
					Within	104	17.3		
Total Arithmetic	35.2	38.0	35.3	37.4	Group	1	95.2	1.17	.28106
					Within	104	81.1		
Spelling	21.0	21.0	21.0	21.0	Group	1	1.3	.02	.87894
					Within	104	57.0		
Capitalization	16.5	18.1	17.0	18.0	Group	1	38.0	1.08	.30045
					Within	104	35.1		

TABLE III (Continued)

Subject	Unadjusted Means Control	Exp.	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Punctuation	15.8	17.1	16.0	17.1	Group	1	24.3	.94	.33561
					Within	104	26.0		
Usage	13.0	15.0	13.0	14.6	Group	1	55.4	3.48	.06457
					Within	104	16.1		
Total Language	66.5	70.2	66.6	70.1	Group	1	231.0	.81	.36907
					Within	104	284.0		

* Required for significance with 1/104 df at the .05 level and an F of 3.94.
Required for significance with 1/104 df at the .01 level and an F of 6.94.[b]

TABLE IV

STATISTICAL COMPARISON OF ACHIEVEMENT BETWEEN THE CONTROL (6R) AND EXPERIMENTAL (7/7) GROUPS FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

	Unadjusted Means		Adjusted Means		Adjusted Analysis of Variance				
Subject	Control N=76	Exp.N=33	Control	Exp.	Source	DF	MS	Adjusted F *	Prob.
Reading	25.1	24.0	25.1	24.0	Group	1	12.3	.52	.46826
					Within	104	23.2		
Arithmetic S.T.A.	50.1	49.0	50.1	48.5	Group	1	64.6	.64	.42284
					Within	104	100.1		
Science	73.1	71.3	73.0	71.0	Group	1	77.0	.47	.49362
					Within	104	205.3		
Social Studies	35.5	40.0	36.1	38.1	Group	1	81.0	.36	.54682
					Within	104	222.0		

* Required for significance with 1/104 df at the .05 level and an F of 3.94.
Required for significance with 1/104 df at the .01 level and an F of 6.94.

Conclusion

Null Hypothesis II, of no significant difference in academic achievement between the C.P.P. and the Graded groups is accepted in all subjects except that of the Iowa arithmetic problem solving test.

HYPOTHESES III

There is no significant difference in academic achievement between a group of boys in the sixth year of the seven-year C.P.P. (6/7) and a group of boys in the fifth grade of the Graded Program (5R) who have repeated one grade.

Results

In the comparison of achievement between boys in the (6/7) group of the C.P.P. and boys in the (5R) group, Table V shows no significant differences in all the Iowa Tests of Basic Skills. Table VI indicates significant differences at the .05 level of confidence in reading and science of the Edmonton standardized tests in favor of the boys in the C.P.P. (6/7) group.

Discussion

The F-ratios failed to attain the critical value of 3.93 required for significance at the .05 level of confidence for the Iowa tests. However, the F-value of 3.86 in vocabulary does approach significance in favor of the C.P.P. group. Also, the adjusted means seem to indicate significant differences in achievement for reading and arithmetic concepts for the Iowa battery of tests in favor of the C.P.P. group even though the critical F-value has not been reached.

With the exception of vocabulary, reading and arithmetic concepts

TABLE V

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE BOYS IN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE IOWA TESTS OF BASIC SKILLS

Subject	Unadjusted Means Control N=73	Exp. N=42	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Vocabulary	23.0	26.7	23.3	26.0	Group	1	184.5	3.86	.05204
					Within	109	48.0		
Reading	34.3	38.0	34.6	37.5	Group	1	214.5	3.02	.08531
					Within	109	71.2		
Arithmetic Concepts	23.7	26.5	24.1	26.1	Group	1	125.4	3.13	.07986
					Within	109	40.1		
Arithmetic Problems	13.4	13.2	13.3	13.2	Group	1	.2	.00	.93780
					Within	109	20.6		
Total Arithmetic	37.2	40.0	37.3	39.4	Group	1	103.8	1.14	.28746
					Within	109	90.8		
Spelling	20.5	21.5	20.8	21.3	Group	1	.6	.09	.75275
					Within	109	56.2		
Capitalization	18.9	17.5	19.0	17.4	Group	1	57.3	1.58	.21135
					Within	109	36.3		

TABLE V (Continued)

Subject	Unadjusted Means Control	Exp.	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Punctuation	14.3	15.3	14.2	15.4	Group	1	34.9	1.93	.16732
					Within	109	18.0		
Usage	14.5	14.1	14.7	13.8	Group	1	18.8	1.04	.31016
					Within	109	18.1		
Total Language	68.0	69.0	68.5	68.1	Group	1	4.0	.01	.80931
					Within	109	254.3		

* Required for significance with 1/109 df at the .05 level and an F of 3.93.
Required for significance with 1/109 df at the .01 level and an F of 6.87.

TABLE VI

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE BOYS IN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

Subject	Unadjusted Means Control N=73	Exp.N=42	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Reading	45.3	102.5	95.6	102.0	Group	1	970.4	4.28[a]	.04087
					Within	109	226.6		
Arithmetic S.T.A.	54.2	53.7	54.6	53.0	Group	1	60.0	.05	.82274
					Within	109	123.2		
Science	51.0	58.0	51.4	56.7	Group	1	685.3	4.66[a]	.03302
					Within	109	147.1		

* Required for significance with 1/109 df at the .05 level and an F of 3.93.[a]
Required for significance with 1/109 df at the .01 level and an F of 6.87.

of the Iowa tests and the reading and science of the Edmonton standardized tests, the results of the remaining tests can be considered as identical in achievement for both groups of boys.

Conclusion

Null Hypothesis III, regarding no significant difference in achievement between a group of boys in the C.P.P. (6/7) and boys in the (5R) Graded group must be rejected pertaining to achievement in reading and science of the Edmonton standardized tests.

HYPOTHESIS IV

There is no significant difference in academic achievement between a group of girls in the sixth year of the seven-year C.P.P. (6/7) and a group of girls in the fifth grade of the Graded Program (5R) who have repeated one grade.

Results

The statistical comparison of achievement between a group of girls in the C.P.P. and a group of girls in the Graded Program are shown in Tables VII and VIII. None of the F-ratios attained the critical value of 4.14 at .05 level with 1 and 33 degrees of freedom, nor the value of 7.47 required at the .01 level of confidence with corresponding degrees of freedom. Hence no significant difference in achievement is observed between the two groups of girls.

Discussion

The F-value of 3.8 in reading for the Edmonton standardized test does approach the critical value of 4.14 in favor of the girls in the Graded Program. In all other tests, the achievement of the

TABLE VII

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE GIRLS IN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE IOWA TESTS OF BASIC SKILLS

Subject	Unadjusted Means Control N=27	Exp. N=12	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Vocabulary	22.3	22.5	22.6	22.1	Group	1	3.7	.12	.72949
					Within	33	30.4		
Reading	33.1	37.6	33.6	36.6	Group	1	68.7	.83	.36800
					Within	33	82.5		
Arithmetic Concepts	23.1	23.5	23.3	23.1	Group	1	1.2	.03	.85792
					Within	33	39.4		
Arithmetic Problem Solving	13.1	13.0	13.5	13.0	Group	1	1.5	.08	.78155
					Within	33	18.8		
Total Arithmetic	36.6	36.4	36.8	36.1	Group	1	5.5	.06	.79945
					Within	33	83.8		
Spelling	26.1	26.0	26.2	26.1	Group	1	1.6	.03	.85302
					Within	33	44.9		
Capitalization	19.0	18.0	19.0	18.1	Group	1	5.8	.16	.68814
					Within	33	35.2		

TABLE VII (Continued)

Subject	Unadjusted Means Control	Exp.	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F	Prob.
Punctuation	15.7	17.0	16.1	16.5	Group	1	2.7	.16	.68814
					Within	33	16.5		
Usage	15.8	15.8	16.1	15.4	Group	1	2.3	.12	.73113
					Within	33	19.1		
Total Language	75.3	76.6	76.0	76.0	Group	1	.2	.00	.97792
					Within	33	260.4		

* Required for significance with 1/33 df at the .05 level and an F of 4.14.
Required for significance with 1/33 df at the .01 level and an F of 7.47.

TABLE VIII

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE GIRLS IN THE CONTROL (5R) AND EXPERIMENTAL (6/7) GROUPS FOR THE EDMONTON SCHOOL BOARD TESTS

Subject	Unadjusted Means Control N=27	Exp.N=12	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F *	Prob.
Reading	102.8	99.6	103.3	98.4	Group	1	188.1	3.8	.06018
					Within	33	49.7		
Arithmetic S.T.A.	52.3	53.1	53.0	52.2	Group	1	2.1	.01	.91154
					Within	33	172.7		
Science	45.0	44.3	46.1	43.1	Group	1	78.3	.70	.41337
					Within	33	114.0		

* Required for significance with 1/33 df at the .05 level and an F of 4.14.
Required for significance with 1/33 df at the .01 level and an F of 7.47.

girls in both groups are almost identical.

Conclusion

Null Hypothesis IV, regarding no significant difference in achievement must be accepted.

HYPOTHESIS V

There is no significant difference in academic achievement between a group of boys in the seventh year of the seven-year C.P.P. (7/7) and a group of boys in the sixth grade of the Graded Program (6R) who have repeated one grade.

Results

The required F-ratio for significance with 1 and 81 degrees of freedom was an F-value of 3.96 at the .05 level and 6.96 at the .01 level of confidence. Table IX shows a significant difference at the .05 level of confidence in arithmetic problem solving achievement in favor of the boys in the (7/7) group of the C.P.P. All other tests of both the Iowa Tests of Basic Skills and the Edmonton standardized tests, showed no significant differences in achievement between the two groups of boys.

Discussion

With the exception of the Iowa arithmetic problem solving test the F-ratios failed to attain the critical values required for significance at the .05 level and .01 level of confidence. However, it should be noted that the F-values of 3.71 in reading, 3.40 in punctuation and 3.62 in language usage of the Iowa Tests, does indicate an

TABLE IX

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE BOYS IN THE CONTROL (6R) AND EXPERIMENTAL (7/7) GROUPS FOR THE IOWA TESTS OF BASIC SKILLS

Subject	Unadjusted Means Control N=63	Exp.N=23	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Vocabulary	23.4	25.3	23.5	25.1	Group	1	31.6	.51	.48294
					Within	81	63.7		
Reading	32.1	36.1	32.0	37.1	Group	1	328.3	3.71	.05834
					Within	81	89.0		
Arithmetic Concepts	23.2	23.2	23.2	23.0	Group	1	.7	.01	.89647
					Within	81	41.0		
Arithmetic Problem Solving	12.1	14.6	12.0	14.5	Group	1	97.2	5.93[a]	.01706
					Within	81	16.4		
Total Arithmetic	35.1	38.1	35.2	38.1	Group	1	81.5	1.02	.31483
					Within	81	80.1		
Spelling	20.5	19.2	20.5	19.3	Group	1	18.7	.36	.55158
					Within	81	52.2		
Capitalization	16.0	17.8	16.0	17.8	Group	1	42.4	1.32	.25453
					Within	81	32.2		

TABLE IX (Continued)

Subject	Unadjusted Means Control N=63	Exp. N=23	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Punctuation	15.0	16.6	15.0	17.1	Group	1	73.3	3.40	.06874
					Within	81	21.5		
Usage	12.3	14.3	12.3	14.2	Group	1	51.2	3.62	.06084
					Within	81	14.2		
Total Language	64.3	67.3	64.2	67.5	Group	1	164.5	.68	.41299
					Within	81	243.1		

* Required for significance with 1/81 df at the .05 level and an F of 3.96.[a]
Required for significance with 1/81 df at the .01 level and an F of 6.96.

approach to significant differences in favor of the (7/7) group of boys of the C.P.P. Table X indicates that the achievement results from the Edmonton standardized tests are almost identical for the two groups of boys.

Conclusion

Null Hypothesis V, relating to no significant differences in achievement between the boys in the (7/7) group of the C.P.P. and the boys in the (6R) group of the Graded Program, is accepted in all cases except in arithmetic problem solving achievement which favors the (7/7) group of boys in the C.P.P.

HYPOTHESIS VI

There is no significant difference in academic achievement between a group of girls in the seventh year of the seven-year C.P.P. (7/7) and a group of girls in the sixth grade of the Graded Program (6R) who have repeated one grade.

Results

The comparison of achievement between the (7/7) group of girls in the C.P.P. and the (6R) group of girls in the Graded Program, as recorded in Tables XI and XII indicate no significant differences in all subjects. In all cases of significance, the critical F-value of 4.41 at the .05 level of confidence was not achieved.

Discussion

Although significant differences in achievement were not attained by the two groups of girls, Table XI does show, however, that the

TABLE X

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE BOYS IN THE CONTROL (6R) AND EXPERIMENTAL (7/7) GROUPS FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

	Unadjusted Means		Adjusted Means		Adjusted Analysis of Variance				
Subject	Control N=63	Exp. N=23	Control	Exp.	Source	DF	MS	Adjusted F*	Prob.
Reading	24.3	24.0	24.3	24.0	Group	1	5.0	.22	.64133
					Within	81	22.4		
Arithmetic S.T.A.	50.0	50.0	50.1	50.0	Group	1	1.0	.01	.91978
					Within	81	1.0		
Science	73.4	75.0	73.5	75.1	Group	1	21.4	.10	.75999
					Within	81	227.8		
Social Studies	35.0	43.0	36.1	40.5	Group	1	318.9	1.21	.27289
					Within	81	261.7		

* Required for significance with 1/81 df at the .05 level and an F of 3.96.
Required for significance with 1/81 df at the .01 level and an F of 6.96.

TABLE XI

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE GIRLS IN THE CONTROL (6R) AND EXPERIMENTAL (7/7) FOR THE IOWA TESTS OF BASIC SKILLS

Subject	Unadjusted Means Control N=13	Exp. N=10	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Vocabulary	24.0	21.4	22.1	24.1	Group	1	9.6	.51	.48486
					Within	18	19.6		
Reading	36.2	33.0	38.0	31.0	Group	1	180.3	3.5	.07857
					Within	18	52.1		
Arithmetic Concepts	22.7	23.0	23.0	22.2	Group	1	3.1	.10	.75358
					Within	18	30.1		
Arithmetic Problem Solving	13.1	15.0	13.5	14.5	Group	1	4.5	.25	.62559
					Within	18	18.4		
Total Arithmetic	36.0	38.0	36.0	37.1	Group	1	.1	.00	.96629
					Within	18	78.5		
Spelling	22.5	25.2	23.5	24.3	Group	1	6.0	.13	.72185
					Within	18	45.2		
Capitalization	18.5	19.0	18.5	19.1	Group	1	.4	.01	.91741
					Within	18	39.3		

TABLE XI (Continued)

Subject	Unadjusted Means Control N=13	Exp. N=10	Adjusted Means Control	Exp.	Adjusted Analysis of Variance Source	DF	MS	Adjusted F*	Prob.
Punctuation	20.1	17.2	21.1	16.1	Group	1	106.6	4.40	.05046
					Within	18	24.2		
Usage	16.3	16.0	16.2	16.1	Group	1	.8	.07	.79423
					Within	18	12.0		
Total Language	77.0	77.1	79.0	75.1	Group	1	66.4	.31	.58351
					Within	18	21.3		

* Required for significance with 1/18 df at the .05 level and an F of 4.41.
Required for significance with 1/18 df at the .01 level and an F of 6.96.

TABLE XII

STATISTICAL COMPARISON OF ACHIEVEMENT AMONG THE GIRLS IN THE CONTROL (6R) AND EXPERIMENTAL (7/7) GROUPS FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

	Unadjusted Means		Adjusted Means		Adjusted Analysis of Variance				
Subject	Control N=13	Exp. N=10	Control	Exp.	Source	DF	MS	Adjusted F*	Prob.
Reading	27.0	25.0	27.1	25.1	Group	1	22.5	1.05	.31976
					Within	18	21.4		
Arithmetic S.T.A.	51.0	47.1	51.0	47.1	Group	1	51.0	.41	.53785
					Within	18	129.0		
Science	69.1	64.1	70.2	62.1	Group	1	270.0	2.45	.13479
					Within	18	110.0		
Social Studies	38.5	32.0	35.0	36.1	Group	1	1.5	.02	.87124
					Within	18	55.1		

* Required for significance with 1/18 df at the .05 level and an F of 4.41.
Required for significance with 1/18 df at the .01 level and an F of 6.96.

F-value of 4.40 and a probability of .05046 in punctuation does approach significance at the .05 level of confidence in favor of the girls in the (6R) group of the Graded Program.

Conclusion

Null Hypothesis VI, regarding no significant differences in academic achievement between the two groups of girls, must be accepted.

SUMMARY OF FINDINGS

To avoid differences between groups of pupils due to chance or errors of sampling, the treatment of data in testing the null hypotheses in this study was considered to be statistically significant between two means only if the F-ratio attained the critical value at the .05 level of confidence.

To make a comparative study of the achievement of pupils in the experimental (C.P.P.) and control (Graded Program) groups, a summary of findings are given in Tables XIII and XIV.

In general, these findings are as follows:

1. In the groups of pupils where the boys' and girls' achievement results were combined, the pupils in the seventh year of the seven-year program of the Continuous Progress Plan scored significantly higher in the Iowa arithmetic problem solving test, but showed no significant differences in all other achievement tests.

2. When the achievement results of the boys and girls were segregated, the boys in the sixth year of the seven-year program of the Continuous Progress Plan scored significantly higher in reading and

TABLE XIII

SUMMARY OF FINDINGS--COMPARISONS OF ACHIEVEMENT FOR THE IOWA TESTS OF BASIC SKILLS

Null H.	Comparison of Achievement Between	Vocabulary Sig. Level	Vocabulary In Favor	Reading Sig. Level	Reading In Favor	Arith. Concepts Sig. Level	Arith. Concepts In Favor	Arith. Prob. Solving Sig. Level	Arith. Prob. Solving In Favor	Total Sig. Level	Total Arith. In Favor
I	5R & 6/7	NSD		NSD		NSD		NSD		NSD	
II	6R & 7/7	NSD		NSD		NSD		.01	CPP 7/7	NSD	
III	5R & 6/7 Boys	NSD		NSD		NSD		NSD		NSD	
IV	5R & 6/7 Girls	NSD		NSD		NSD		NSD		NSD	
V	6R & 7/7 Boys	NSD		NSD		NSD		.05	CPP 7/7	NSD	
VI	6R & 7/7 Girls	NSD		NSD		NSD		NSD		NSD	

TABLE XIII (Continued)

Null H.	Comparison of Achievement Between	Spelling Sig. Level	Spelling In Favor	Capitalization Sig. Level	Capitalization In Favor	Punctuation Sig. Level	Punctuation In Favor	Language Usage Sig. Level	Language Usage In Favor	Total Language Sig. Level	Total Language In Favor
I	5R & 6/7	NSD		NSD		NSD		NSD		NSD	
II	6R & 7/7	NSD		NSD		NSD		NSD		NSD	
III	5R & 6/7 Boys	NSD		NSD		NSD		NSD		NSD	
IV	5R & 6/7 Girls	NSD		NSD		NSD		NSD		NSD	
V	6R & 7/7 Boys	NSD		NSD		NSD		NSD		NSD	
VI	6R & 7/7 Girls	NSD		NSD		NSD		NSD		NSD	

TABLE XIV

SUMMARY OF FINDINGS--COMPARISONS OF ACHIEVEMENT FOR THE EDMONTON PUBLIC SCHOOL BOARD TESTS

Null H.	Comparison of Achievement Between	Reading Sig. Level	Reading In Favor	Arithmetic S.T.A. Sig. Level	Arithmetic S.T.A. In Favor	Science Sig. Level	Science In Favor	Social Studies Sig. Level	Social Studies In Favor
I	5R & 6/7 Groups	NSD		NSD		NSD			
II	6R & 7/7 Groups	NSD		NSD		NSD		NSD	
III	5R & 6/7 Boys	.05	CPP 6/7	NSD		.05	CPP 6/7		
IV	5R & 6/7 Girls	NSD		NSD		NSD			
V	6R & 7/7 Boys	NSD		NSD		NSD		NSD	
VI	6R & 7/7 Girls	NSD		NSD		NSD		NSD	

science of the Edmonton standardized tests, but showed no significant difference in all other achievement tests.

3. When the achievement results of the boys and girls were segregated, the boys in the seventh year of the seven-year program of the Continuous Progress Plan scored significantly higher in the Iowa arithmetic problem solving test, but showed no significant differences in achievement in all other tests.

4. When the achievement results of the boys and girls were segregated, the girls showed no significant differences in all tests.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

STATEMENT OF THE PROBLEM

The purpose of this study was to compare the academic achievement of two slow groups in the sixth and seventh years of the seven-year program (C.P.P.) with that of two groups of pupils in the fifth and sixth grades of the traditionally Graded Program who have repeated one grade of their elementary program.

HYPOTHESES

In this study six null hypotheses were tested which included the comparison of academic achievement in vocabulary, reading, arithmetic, spelling, capitalization, punctuation and language usage of the Iowa Tests of Basic Skills, and reading, arithmetic, science and social studies of the Edmonton Standardized tests between the following groups of pupils:

1. Boys and girls in the sixth year of the seven-year program (6/7) of the C.P.P. and boys and girls in the fifth grade of the Graded Program (5R) who repeated one grade.

2. Boys and girls in the seventh year of the seven-year program (7/7) of the C.P.P. and boys and girls in the sixth grade of the Graded Program (6R) who repeated one grade.

3. Boys in the sixth year of the seven-year program (6/7) of

the C.P.P. and boys in the fifth grade of the Graded Program (5R) who repeated one grade.

4. Girls in the sixth year of the seven-year program (6/7) of the C.P.P. and girls in the fifth grade of the Graded Program (5R) who repeated one grade.

5. Boys in the seventh year of the seven-year program (7/7) of the C.P.P. and boys in the sixth grade of the Graded Program (6R) who repeated one grade.

6. Girls in the seventh year of the seven-year program (7/7) of the C.P.P. and girls in the sixth grade of the Graded Program (6R) who repeated one grade.

CONCLUSIONS

With the exception of the Iowa arithmetic problem solving test, this study would indicate that there are no significant differences in academic achievement between groups of boys and girls in the C.P.P. and groups of boys and girls who repeated one grade in the Graded Program. One must conclude, however, that even though only one test showed a significant difference in favor of the C.P.P. group of boys and girls it would appear that the deceleration of seven-year C.P.P. pupils has not had an adverse effect on their academic achievement. It must be pointed out that the approach to significant differences in reading in both batteries of tests, the pronounced significant difference in arithmetic problem solving of the Iowa test, and the greater number of higher adjusted mean scores in favor of the C.P.P. groups should not be

overlooked. This evidence could be considered as an indication of higher academic achievement for slow pupils in the C.P.P.

When a comparison in academic achievement was made for the segregated boys and girls in each of the groups, the achievement results showed significant differences that favored the boys in the C.P.P. in reading, arithmetic problem solving and science. Although the critical F-value, indicating significant differences, was not achieved by the girls in the two groups, it is interesting to note that the adjusted means were higher in eight tests in favor of the girls in the Graded Program.

IMPLICATIONS

The reading tests of both the Iowa and the Edmonton standardized tests indicate an approach to significant differences in favor of the slow pupils in the C.P.P. If we assume that the presentation and the content covered by both groups were basically similar, then the instructional reading program adapted to the slow learner's rate of learning in the C.P.P. may be considered as superior to that of the Graded Program where the slow pupil may repeat a year of reading material. Another possibility is that the pupils who repeated one year in the Graded Program may be exposed to the same presentation and content as the pupils who were average or superior readers.

The significant difference in arithmetic problem solving of the Iowa test in favor of the C.P.P. group may be due to the slow rate at which arithmetic is being taught in the C.P.P. Also, the slow pupils in

the Graded Program may have met considerable frustration in their attempt to keep pace with average or superior pupils. Another possibility of the higher achievement in arithmetic problem solving of the C.P.P. group may be that they had more years of instruction with the "Seeing Through Arithmetic" series, than their counterparts in the Graded Program who may have had more years of instruction in traditional mathematics. That is, the C.P.P. group may have had more instruction and drill in expressing mathematical problems in equation form thus enabling them to attain a higher achievement in the Iowa test which is based on a more traditional approach to mathematics.

When the achievement results of the boys and girls were separated and subjected to statistical analysis, the boys in the C.P.P. scored significantly higher in reading, arithmetic problem solving and science than the boys in the Graded Program. From this evidence, it may appear that boys are more apt to react against the repetition of a year's work, thus causing a further retardation in their academic progress. On the other hand, when the academic results of the girls were analyzed, the higher adjusted means of eight tests may indicate that girls may profit from the repetition of a grade. As shown in Tables VII, VIII, XI, and XII of Chapter IV, the critical F-values for significant differences between the groups of girls was not achieved. The meagre statistical evidence of higher adjusted means in eight tests in favor of the girls in the Graded Program does not necessarily indicate that girls would profit by the repetition of a grade.

In most instances research does indicate that the homogeneous

grouping of pupils has produced favorable gains in academic achievement. To accomplish this gain in academic achievement, the homogeneous group must be exposed to a curriculum and a teaching technique which is adapted to their ability to learn. Consequently, differentiated curriculum and teaching methods must be adopted for the various ability groups of an elementary school system. Too often, the curriculum that is developed for average and superior pupils, or a watered down version thereof is used for slow learners. Simply increasing the time span to complete the curriculum material is contrary to the findings of recent research. Also, the supposition that the organizational structure which would accommodate homogeneous grouping will in itself produce improved academic achievement is a popular misconception.

The results in this study indicate that the pupils in the C.P.P. do as well or in a few cases do better in achievement than pupils who have repeated one grade. These results validate the findings of most research projects which have dealt with school policies regarding promotion or nonpromotion practices. In most of the related literature, educators agree that retention or retardation of pupils' progress should be permitted only in very exceptional circumstances.

In a large number of educational programs that institute homogeneous grouping there is considerable evidence to indicate that many teachers use the same techniques and curriculum material for each homogeneous group in their classrooms. More supervisory direction, discussion, experimentation and frequent evaluations of teaching methods and material are very necessary for the success of any school plan. The

administrative and supervisory staffs must make an intensive effort to inform teachers of the structure and desired objectives during the initial stages of a plan. Both new and experienced teachers must be convinced that a plan has merit before cooperation is possible. Only by direct involvement of teachers in the organization and evaluation of a new plan will there be any assurance of successful results.

RECOMMENDATIONS FOR FURTHER STUDY

This study is the third which has attempted to analyze and evaluate aspects of the Continuous Progress Plan in Edmonton. Further studies are recommended and the following are presented for consideration.

1. A city-wide survey which would determine teachers' assessment of the Continuous Progress Plan.

2. A study which would measure the effect on personal and social development of pupils who are placed in the superior and slow groups of the Continuous Progress Plan.

3. After leaving the seven-year program of the C.P.P. some of the slow learners will be streamed into the modified Junior High program, the opportunity classes or the pre-employment classes of the Edmonton Public School System. An assessment of these post-elementary programs would be a most worthwhile study.

4. A survey which would determine the opinions of parents who have children in the slow groups of the Continuous Progress Plan.

5. An evaluation of academic achievement of former C.P.P.

pupils who are at higher grade levels.

6. A study which would evaluate to what extent present teaching methods and curricula in the C.P.P. provide for differentiated instruction for the various groups.

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APPENDIX A

RELIABILITY AND VALIDITY

Iowa Tests of Basic Skills

The standard errors of measurement and the reliability coefficient were taken from the Manual For Administrators, Supervisors and Counselors and they are recorded in Table XV. Reliability coefficients were computed by the split-halves procedure. Each coefficients is based on five hundred cases drawn at random from the complete standardization sample at that grade level. Reliability data presented apply to scores obtained at the beginnings of the school year. In the limited preliminary data slightly higher coefficients were indicated for scores obtained at mid-year and end-of-the-year testings.[63]

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[63]University of Iowa, Manual for Administrators, Supervisors and Counselors, Iowa Tests of Basic Skills (Boston: Houghton Mifflin Company, 1956), pp. 71-72.

TABLE XV

STANDARD ERRORS OF MEASUREMENT AND RELIABILITY COEFFICIENTS FOR THE IOWA TESTS OF BASIC SKILLS: GRADES FIVE AND SIX

Test	Grade Five Standard Error Of Measurement Raw Score Units	Reliability Coefficient	Grade Six Standard Error of Measurement Raw Score Units	Reliability Coefficient
Vocabulary	2.62	.92	2.89	.92
Reading	3.72	.94	3.64	.93
Language Skills	1.38	.95	1.39	.95
Arithmetic Skills	1.78	.89	1.94	.90

California Reading Test

Tiegs and Clark show the coefficients of reliability and standard errors of measurement in the following table:[64]

TABLE XVI

COEFFICIENTS OF RELIABILITY AND STANDARD ERRORS OF MEASUREMENT FOR THE CALIFORNIA READING TEST

Test	Reliability	S.E. Measurement
Reading Vocabulary	.88	0.50
Reading Comprehension	.93	0.39
Total Reading	.93	0.39

The authors make the claim that the California Reading Test does possess a high degree of validity. They report that the test has been developed over a period of many years, through four editions, and the items were tried out in widely separated geographical areas of the U.S.A.

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[64]Ernest W. Tiegs and Willis W. Clark, Manual: California Reading Test (Los Angeles: California Test Bureau, 1950), p. 4.

APPENDIX B

TABLE XVII

ANALYSIS OF VARIANCE OF COVARIATES FOR GROUPS 5R AND 6/7

Covariate	Source	DF	Analysis of Variance SS	MS	F	Prob.
	Tot.	153	6951.6561			
Age	Grp.	1	7.3124999	7.3124999	.16005832	.68967
	Wth.	152	6944.3437	45.686472		
Lorge-Thorndike	Tot.	153	15428.500			
Verbal I.Q.	Grp.	1	127.71875	127.71875	1.2687751	.26177
	Wth.	152	15300.781	100.66303		
Lorge-Thorndike	Tot.	153	17716.125			
Non-Verbal I.Q.	Grp.	1	13.828125	13.828125	.11873459	.73089
	Wth.	152	17702.297	116.4624		
Blishen	Tot.	153	5885.4765			
S.E.S.	Grp.	1	411.39062	411.39062	11.423163[b]	.00092
	Wth.	152	5474.0859	36.013723		

Required for significance with 1/152 df at the .05 level and an F of 3.91.

Required for significance with 1/152 df at the .01 level and an F of 6.81.[b]

TABLE XVIII

ANALYSIS OF VARIANCE OF COVARIATES FOR GROUPS 6R AND 7/7

Covariate	Source	DF	Analysis of Variance SS	MS	F	Prob.
	Tot.	108	5347.500			
Age	Grp.	1	45.437500	45.437500	.91700951	.34042
	Wth.	107	5301.8124	49.549649		
Laycock	Tot.	108	10648.211			
I.Q.	Grp.	1	12.914062	12.914062	.12992629	.71922
	Wth.	107	10635.297	99.395296		
Blishen	Tot.	108	4303.1328			
S.E.S.	Grp.	1	152.31640	152.31640	3.9264217	.05010
	Wth.	107				

Required for significance with 1/107 df at the .05 level and an F of 3.94.

Required for significance with 1/107 df at the .01 level and an F of 6.90.

APPENDIX C

TABLE XIX

MEANS AND STANDARD DEVIATIONS OF THE CONTROL 5R GROUP

	Mean	Standard Deviation
Age	144.42 (months)	6.82
Verbal I.Q.	91.11	10.97
Non-Verbal I.Q.	98.98	11.10
Blishen (S.E.S.)	45.45	5.00
Vocabulary (Iowa)	22.75	8.32
Reading	34.00	10.69
Spelling	22.00	8.65
Capitalization	18.92	6.01
Punctuation	14.69	4.41
Usage	14.87	4.99
Total Language	70.00	18.72
Arithmetic Concepts	23.53	7.97
Arithmetic Problems	13.41	5.00
Total Arithmetic	37.03	11.71
Reading (California)	97.31	15.90
S.T.A.	53.71	12.75
Science	49.14	13.53

TABLE XX

MEANS AND STANDARD DEVIATIONS OF EXPERIMENTAL 6/7 GROUP

	Mean	Standard Deviation
Age	143.96 (months)	6.52
Verbal I.Q.	99.02	7.77
Non-Verbal I.Q.	98.35	9.98
Blishen (S.E.S.)	48.87	7.42
Vocabulary (Iowa)	25.76	6.13
Reading	37.93	9.24
Spelling	22.74	7.56
Capitalization	17.57	6.67
Punctuation	15.65	4.82
Usage	14.52	4.50
Total Language	70.67	18.25
Arithmetic Concepts	25.80	6.21
Arithmetic Problems	13.11	4.74
Total Arithmetic	38.91	9.42
Reading (California)	101.89	13.54
S.T.A.	53.54	13.12
Science	54.94	15.68

TABLE XXI

MEANS AND STANDARD DEVIATIONS OF CONTROL 6R GROUP

	Mean	Standard Deviations
Age	158.92 (months)	6.68
Laycock I.Q.	93.64	8.30
Blishen (S.E.S.)	46.99	4.45
Vocabulary (Iowa)	23.47	8.12
Reading	32.80	10.07
Spelling	20.84	8.21
Capitalization	16.51	6.29
Punctuation	15.75	5.42
Usage	12.95	4.15
Total Language	66.47	18.54
Arithmetic Concepts	23.11	6.75
Arithmetic Problems	12.11	4.11
Total Arithmetic	35.21	9.44
Reading (unit scales)	24.78	4.67
S.T.A.	49.97	10.50
Science	72.68	15.69
Social Studies	35.55	13.37

TABLE XXII

MEANS AND STANDARD DEVIATIONS OF EXPERIMENTAL 7/7 GROUP

	Mean	Standard Deviations
Age	157.52 (months)	7.60
Laycock I.Q.	94.39	12.80
Blishen (S.E.S.)	49.56	8.95
Vocabulary (Iowa)	24.12	9.88
Reading	34.97	12.01
Spelling	21.03	8.35
Capitalization	18.12	5.94
Punctuation	16.79	5.74
Usage	14.73	4.48
Total Language	70.21	20.46
Arithmetic Concepts	23.00	7.21
Arithmetic Problems	14.70	4.94
Total Arithmetic	37.70	11.36
Reading (unit scale)	24.06	6.01
S.T.A.	49.00	14.01
Science	71.39	16.49
Social Studies	39.55	20.98

APPENDIX D

RAW SCORES FOR 5R GROUP

Pupil No.	Group No.	Sex	Age	Lorge-Thorndike			Blishen No.	Iowa Tests										EPSB Tests		
				Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.		Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith. I	Arith. II	Total Arith.	Reading	S.T.A.	Science
001	1	1	159	084	090	174	45.2	15	34	16	10	13	10	049	22	16	38	097	40	10
002	1	2	156	081	078	159	47.1	18	25	37	19	13	17	086	11	12	23	094	24	40
003	1	1	136	092	097	189	49.2	17	27	18	26	14	15	073	22	07	29	101	37	41
004	1	1	146	101	108	209	53.7	19	33	29	16	14	16	075	33	12	45	107	64	46
005	1	1	142	096	095	191	44.4	30	19	07	24	15	11	057	17	09	26	086	44	48
006	1	2	147	086	101	187	46.0	17	23	25	26	19	14	084	28	12	40	096	56	35
007	1	2	142	105	106	211	41.6	18	30	32	21	09	17	079	15	07	22	110	44	32
008	1	2	141	102	094	196	73.2	23	35	23	10	19	14	066	25	11	36	108	61	46
009	1	2	138	105	113	218	50.1	16	42	30	28	27	19	094	37	21	58	106	70	54
010	1	2	140	110	104	214	43.6	36	49	30	26	24	23	103	28	18	46	113	61	61
011	1	2	141	124	120	244	45.6	37	44	26	23	21	15	085	27	19	46	122	65	67
012	1	1	139	104	112	216	57.0	22	36	32	23	17	16	088	33	15	48	108	64	57
013	1	1	150	091	076	167	41.6	31	30	08	09	10	07	034	10	08	18	102	64	57
014	1	1	142	104	103	207	44.4	23	30	16	13	12	16	057	32	09	41	101	54	52
015	1	2	164	079	085	164	45.6	19	24	30	17	11	16	047	15	06	21	100	36	43
016	1	1	144	078	099	177	45.2	12	15	09	18	10	09	046	14	11	25	068	57	37
017	1	1	142	095	101	196	35.2	16	31	17	16	11	10	054	23	14	37	086	50	40
018	1	2	146	090	080	170	43.6	19	24	29	23	17	14	083	18	10	28	097	55	25
019	1	2	143	120	110	230	45.5	26	24	17	15	17	22	071	23	13	36	108	50	47
020	1	2	141	101	104	205	43.6	25	42	29	23	20	15	087	30	19	49	109	67	61
021	1	2	140	098	091	189	47.6	26	33	30	25	14	19	088	21	15	36	102	51	47
022	1	1	143	092	088	180	43.0	28	34	29	21	14	15	079	29	18	47	090	55	45
023	1	1	143	106	106	212	43.6	35	51	15	26	20	22	083	38	24	64	118	73	59
024	1	2	137	095	104	199	45.6	25	46	34	23	15	11	083	29	15	44	108	52	47
025	1	2	147	087	097	184	47.2	26	33	22	05	13	11	051	35	14	49	098	53	52

RAW SCORES FOR 5R GROUP

				Lorge-Thorndike			Iowa Tests											EPSB Tests		
Pupil No.	Group No.	Sex	Age	Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science
026	1	1	143	105	115	220	47.0	32	41	29	22	20	23	094	33	16	49	119	56	74
027	1	1	141	099	092	191	46.8	27	46	11	19	16	18	063	32	16	48	106	56	58
028	1	1	144	093	101	194	43.2	31	48	21	24	14	18	077	30	19	49	105	65	64
029	1	1	140	108	115	223	44.4	39	56	30	21	17	22	090	36	14	50	121	63	77
030	1	1	139	099	103	202	47.2	31	50	20	26	11	11	068	29	13	42	106	63	64
031	1	2	143	106	107	213	43.6	19	32	29	24	19	18	090	26	21	47	101	51	53
032	1	2	144	094	110	205	40.8	16	43	25	19	18	16	078	27	19	46	097	62	42
033	1	1	164	083	086	169	40.8	27	34	15	13	15	15	058	24	16	40	108	47	51
034	1	1	141	100	119	218	40.8	17	28	27	20	18	21	086	18	15	33	097	51	38
035	1	2	146	095	090	185	47.0	30	45	28	15	14	20	077	23	17	35	099	51	48
036	1	1	138	099	084	174	45.6	30	43	31	22	13	19	085	24	14	38	101	47	50
037	1	1	135	114	108	222	46.8	20	34	24	11	14	13	062	27	16	43	109	57	63
038	1	1	140	108	088	196	47.2	34	42	32	26	19	08	085	26	13	39	113	45	63
039	1	1	157	107	113	220	55.6	21	49	31	29	22	18	100	07	23	30	107	74	67
040	1	1	136	115	129	244	47.6	20	43	29	21	16	13	079	30	25	55	113	70	65
041	1	2	141	089	088	177	43.2	19	27	23	20	10	20	073	18	12	30	108	56	41
042	1	1	140	110	124	234	44.4	37	47	31	22	12	18	083	28	19	47	113	62	67
043	1	1	144	102	098	200	45.6	24	41	20	22	13	18	073	28	22	50	084	61	66
044	1	1	151	082	084	166	56.8	16	24	08	19	12	10	049	18	05	23	072	22	36
045	1	1	142	106	105	211	48.1	31	48	33	29	17	19	098	38	17	55	114	66	77
046	1	1	142	122	111	233	48.1	36	48	26	18	10	19	074	26	17	43	106	67	71
047	1	1	144	106	106	212	49.4	28	42	26	12	14	12	064	31	14	45	101	60	62
048	1	1	143	097	093	190	47.6	18	21	20	11	08	05	044	13	13	26	100	43	50
049	1	1	143	112	100	212	49.6	31	39	37	25	14	14	090	26	13	39	081	54	81
050	1	1	143	088	105	193	45.6	15	37	14	24	15	19	072	26	16	42	098	54	54

RAW SCORES FOR 5R GROUP

				Lorge-Thorndike			Iowa Tests										EPSB Tests		
Pupil No.	Group No.	Sex	Age	Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science
051	1	1	151	090	111	201	35.2	23	38	14	24	18	12	068	33	18	51	096	42	42
052	1	1	136	112	107	219	56.7	30	49	39	22	13	17	093	24	10	34	108	57	69
053	1	1	138	098	109	207	56.0	19	26	26	12	13	12	063	28	10	38	102	57	62
054	1	2	158	095	091	186	40.8	14	42	24	18	13	14	069	21	06	27	095	31	33
055	1	2	155	082	092	174	48.2	18	37	20	17	16	10	063	21	17	38	110	50	36
056	1	1	147	087	085	172	43.6	08	09	22	09	08	10	049	07	07	14	098	39	37
057	1	1	154	077	091	168	43.6	13	18	16	14	12	15	057	12	05	17	076	61	30
058	1	2	144	083	097	180	40.8	09	19	30	14	14	12	070	10	04	14	092	24	24
059	1	1	152	102	086	188	40.8	25	28	23	12	07	13	055	17	08	25	089	57	37
060	1	1	151	088	094	182	48.0	20	39	17	22	17	07	063	25	13	38	107	57	42
061	1	1	159	072	094	166	40.2	08	09	03	05	03	01	012	07	07	14	074	32	23
062	1	2	137	105	095	200	35.2	25	10	07	10	07	04	028	09	18	27	094	45	44
063	1	1	147	093	096	189	43.6	14	35	31	16	10	10	067	21	19	40	105	42	42
064	1	1	145	091	089	180	40.2	09	32	12	19	14	13	058	26	14	40	101	52	35
065	1	1	136	106	106	212	50.2	37	39	07	12	09	02	030	17	07	24	076	56	66
066	1	1	141	111	113	224	46.8	05	39	07	06	25	18	056	35	24	59	114	72	60
067	1	1	142	091	089	180	50.2	07	31	08	11	09	12	041	10	08	18	102	54	55
068	1	1	151	083	087	170	43.6	21	27	07	18	11	11	047	18	05	23	074	36	40
069	1	2	142	099	091	190	44.5	30	41	31	19	13	16	079	22	07	29	108	63	43
070	1	1	142	098	101	199	46.0	34	47	18	21	18	20	077	22	16	38	113	58	57
071	1	1	139	094	105	199	43.6	24	29	21	19	13	17	070	18	10	28	087	54	43
072	1	1	144	100	090	190	49.2	29	45	33	23	15	16	087	22	12	34	108	51	52
073	1	1	149	086	090	176	47.2	20	32	14	19	11	18	062	33	18	55	075	70	61
074	1	1	145	090	092	182	41.6	09	22	17	16	22	08	063	20	06	25	084	56	41
075	1	1	140	099	103	202	43.6	18	29	18	20	12	14	064	14	08	22	098	51	50

RAW SCORES FOR 5R GROUP

				Lorge-Thorndike			Iowa Tests										EPSB Tests		
Pupil No.	Group No.	Sex	Age	Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science
076	1	1	138	103	096	199	41.6	23	43	15	22	15	18	070	28	19	47	113	57	56
077	1	2	145	098	104	202	45.6	18	28	33	21	17	16	087	23	18	41	107	44	46
078	1	1	156	104	095	199	43.2	30	43	14	17	13	19	063	26	18	44	105	44	62
079	1	1	139	098	114	212	43.2	17	35	28	28	18	18	092	38	21	59	110	85	52
080	1	1	162	070	106	176	41.6	17	13	02	14	14	07	037	12	08	20	081	33	32
081	1	2	139	098	111	209	47.7	30	33	19	16	14	11	060	35	18	53	096	77	55
082	1	1	137	102	112	214	43.3	38	50	25	26	19	25	095	32	14	46	111	64	56
083	1	1	138	098	106	204	45.0	35	51	32	26	22	19	099	30	22	52	106	79	58
084	1	1	139	093	092	185	47.2	18	34	23	22	15	10	070	24	11	35	091	56	34
085	1	1	138	084	085	169	41.6	12	22	07	19	09	08	043	26	12	38	076	66	32
086	1	1	148	085	100	185	40.0	26	27	11	10	12	08	041	13	11	24	081	44	45
087	1	2	138	096	104	200	40.8	27	30	23	23	19	18	083	33	13	46	097	63	41
088	1	1	142	110	103	204	51.7	40	47	33	25	24	23	105	34	12	46	120	67	68
089	1	1	135	116	110	226	47.2	31	29	10	27	23	16	076	28	15	43	110	68	63
090	1	1	141	103	094	203	46.0	16	36	16	21	13	19	069	25	17	42	102	68	49
091	1	1	141	105	111	216	43.3	28	41	37	31	19	21	108	32	19	51	056	69	33
092	1	1	136	119	101	220	44.7	19	35	26	18	16	24	084	22	11	33	029	44	36
093	1	1	158	081	076	157	47.6	28	36	21	18	10	14	063	10	12	22	053	27	15
094	1	1	138	108	110	208	40.0	29	40	27	28	20	16	091	26	07	33	058	23	47
095	1	1	158	096	089	185	47.2	30	15	25	09	12	12	059	22	11	33	089	41	40
096	1	1	152	080	091	171	35.0	11	18	21	05	05	12	032	10	08	18	075	31	38
097	1	1	153	088	090	178	45.6	07	21	19	11	12	08	050	13	10	23	073	52	39
098	1	1	145	090	092	182	40.0	18	37	20	20	19	14	073	22	08	30	104	51	50
099	1	1	146	095	099	194	49.8	13	09	17	24	15	22	078	25	06	31	087	50	64
100	1	2	146	094	067	161	45.2	17	33	19	14	11	24	068	13	08	21	101	51	53

RAW SCORES FOR 6/7 GROUP

				Lorge-Thorndike			Iowa Tests											EPSB Tests		
Pupil No.	Group No.	Sex	Age	Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science
101	2	1	145	101	106	207	44.5	28	41	21	11	09	14	055	26	11	37	106	52	55
102	2	1	143	103	102	205	45.6	26	46	24	13	09	12	058	29	15	44	111	67	40
103	2	1	136	115	102	217	64.0	36	53	23	20	08	22	073	30	17	47	115	67	50
104	2	1	141	102	105	207	43.6	31	49	24	16	16	17	063	27	10	37	113	43	70
105	2	1	145	096	102	198	43.6	25	36	20	15	14	13	062	23	09	32	097	44	40
106	2	1	138	105	120	225	57.0	24	47	24	26	23	20	093	26	08	34	110	50	80
107	2	1	143	103	096	199	48.2	30	47	28	13	16	17	074	29	19	48	108	63	45
108	2	1	143	101	088	189	43.6	28	46	30	11	23	15	079	33	22	55	109	67	75
109	2	1	154	094	100	194	50.2	30	45	14	12	12	16	054	27	15	42	109	45	55
110	2	1	145	101	098	199	54.1	22	34	25	19	09	10	063	31	13	44	079	63	51
111	2	1	146	090	076	166	54.1	26	20	25	12	08	05	050	16	04	21	108	31	35
112	2	1	141	103	097	200	46.0	31	42	22	27	16	12	077	29	15	44	114	69	61
113	2	1	145	096	088	184	57.0	19	23	13	09	06	09	037	11	07	18	085	24	34
114	2	1	146	104	104	208	41.6	14	28	28	13	12	12	065	17	12	29	111	55	42
115	2	1	147	088	061	149	41.6	20	28	22	19	17	09	067	08	09	17	029	24	37
116	2	2	136	102	109	218	45.4	22	51	31	25	19	18	093	24	12	36	109	43	44
117	2	1	152	098	086	184	50.2	32	44	20	21	21	17	079	24	08	32	099	51	44
118	2	1	139	106	109	215	43.2	29	48	36	30	19	20	105	27	14	41	112	49	78
119	2	1	144	101	101	202	43.6	31	47	29	16	15	13	073	27	16	43	116	44	90
120	2	1	135	111	114	225	43.2	30	44	20	26	19	14	079	31	18	49	109	64	61
121	2	2	141	099	088	187	41.4	20	34	24	12	17	05	058	22	09	31	081	32	36
122	2	1	142	101	111	212	43.3	29	29	29	28	16	14	087	27	13	40	110	63	46
123	2	1	139	104	110	214	64.0	32	30	24	23	10	15	072	32	12	44	100	67	62
124	2	1	141	097	098	195	43.2	26	37	25	22	24	17	088	31	06	37	101	55	34
125	2	2	149	093	099	192	40.8	25	26	34	19	19	13	075	21	13	34	104	47	44
126	2	1	141	101	104	205	53.3	26	40	23	14	14	17	068	21	18	39	103	61	44
127	2	1	141	100	095	195	44.8	29	38	13	05	11	10	039	30	18	48	100	60	69

RAW SCORES FOR 6/7 GROUP

				Lorge-Thorndike			Iowa Tests										EPSB Tests		
Pupil No.	Group No.	Sex	Age	Verbal I.Q.	Non-Verb. I.Q.	Total I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science
128	2	1	141	096	090	186	49.8	15	26	26	18	14	13	071	20	09	29	081	44	52
129	2	2	153	088	108	196	45.6	10	30	17	17	15	16	065	17	11	28	094	78	45
130	2	1	149	092	113	205	56.0	36	51	33	33	26	15	107	36	11	47	112	61	81
131	2	1	141	094	095	189	57.0	22	27	12	18	15	08	053	26	07	33	100	46	66
132	2	1	138	098	099	197	43.2	30	47	22	26	24	16	088	30	14	44	098	62	55
133	2	2	138	108	105	213	43.6	32	46	25	11	15	14	065	16	10	26	088	38	16
134	2	2	140	101	095	196	50.1	24	27	22	19	18	20	079	31	14	45	104	59	37
135	2	1	149	087	086	173	40.0	17	23	14	21	13	07	055	25	18	43	100	50	50
136	2	1	147	112	115	217	54.8	37	49	29	29	24	24	106	36	21	57	114	77	74
137	2	1	152	090	101	191	43.3	16	39	17	21	16	13	077	32	18	50	100	55	39
138	2	2	152	094	098	192	78.8	27	46	26	12	19	18	074	18	05	23	101	35	52
139	2	2	135	113	100	213	56.7	25	49	35	26	25	22	108	35	19	54	111	78	72
140	2	2	152	094	090	184	43.6	14	27	21	23	19	15	078	24	16	40	096	56	61
141	2	1	143	088	095	183	55.0	25	33	19	14	15	19	067	36	16	52	090	68	65
142	2	1	168	081	095	176	55.0	20	34	04	13	16	14	047	31	21	52	105	68	66
143	2	1	139	102	094	196	47.2	21	24	08	09	13	05	035	22	08	30	112	55	69
144	2	1	143	095	100	195	37.5	28	37	14	12	14	11	051	23	08	31	095	41	63
145	2	1	137	091	098	189	48.1	26	24	30	12	15	11	068	21	15	36	099	35	53
146	2	1	138	111	100	221	57.0	29	38	15	13	14	23	065	26	15	41	115	64	76
147	2	1	140	108	100	208	49.6	26	36	12	13	15	11	051	33	23	56	103	62	72
148	2	1	162	083	092	175	47.2	17	29	10	13	12	13	048	21	09	30	102	54	70
149	2	2	145	086	097	183	45.6	23	34	16	05	08	18	047	22	13	35	102	40	33
150	2	2	151	105	094	199	46.3	23	51	34	27	21	18	100	21	21	42	094	66	39
151	2	1	136	106	112	218	46.8	35	50	17	10	12	11	050	33	03	36	114	45	59
152	2	2	142	095	087	182	60.1	26	31	27	19	09	13	068	31	12	43	111	65	52
153	2	1	148	105	097	202	44.5	38	47	35	26	16	21	098	28	16	44	112	52	81
154	2	1	137	109	086	195	45.6	28	40	37	12	21	19	089	20	11	31	101	37	47

RAW ACHIEVEMENT SCORES FOR 6R GROUP

						Iowa Tests										EPSB Tests			
Pupil No.	Group No.	Sex	Age	Laycock I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science	Social Studies
155	3	1	164	090	51.8	24	27	21	12	22	08	063	16	08	24	21	27	81	26
156	3	1	154	097	44.5	34	46	10	18	14	16	058	23	11	34	27	53	79	37
157	3	2	167	083	61.8	31	37	21	18	11	18	068	14	09	23	30	37	53	62
158	3	2	149	097	54.8	26	39	09	28	29	20	086	23	15	38	28	54	69	57
159	3	1	169	074	43.6	22	18	09	09	10	09	037	16	10	26	21	43	63	27
160	3	1	161	102	43.6	29	19	28	19	13	14	074	34	10	44	26	64	82	79
161	3	1	166	090	47.2	32	23	09	09	07	08	033	27	09	36	27	60	85	80
162	3	1	153	085	49.2	08	22	07	08	10	06	031	21	09	30	19	40	57	18
163	3	1	160	093	48.2	15	31	16	20	16	09	061	36	11	47	24	62	88	83
164	3	1	158	087	47.2	28	38	20	15	10	16	061	29	09	38	24	65	93	37
165	3	2	151	085	47.2	10	24	22	13	19	07	061	21	07	28	14	49	71	25
166	3	1	152	092	44.5	25	29	30	19	20	10	079	16	07	23	22	30	30	38
167	3	1	156	099	50.2	23	45	26	20	16	14	076	25	16	41	31	57	87	38
168	3	1	156	094	44.5	20	21	28	16	21	11	076	20	14	34	22	48	88	27
169	3	1	157	093	45.8	18	28	09	15	09	09	042	30	05	35	17	46	71	36
170	3	1	176	089	57.0	09	29	22	16	19	15	072	23	06	29	22	42	35	20
171	3	2	159	077	42.8	19	20	18	07	14	10	049	12	10	22	24	37	51	28
172	3	2	159	089	52.2	24	29	18	10	14	16	058	22	13	35	30	57	55	34
173	3	1	158	087	49.8	09	23	11	20	14	05	050	25	08	33	19	60	50	78
174	3	1	153	096	43.6	16	34	21	24	17	13	075	15	15	30	24	41	60	34
175	3	1	145	089	40.8	13	18	19	04	06	09	038	12	09	21	10	37	43	17
176	3	1	160	084	41.6	12	28	14	09	10	07	040	20	05	25	25	50	41	21
177	3	1	158	100	40.8	30	33	15	11	20	14	060	31	12	43	16	59	77	31
178	3	1	154	106	43.6	33	47	34	22	15	12	083	14	08	22	28	55	92	41
179	3	1	162	092	47.2	38	46	33	18	20	13	084	26	13	39	29	36	93	47

RAW ACHIEVEMENT SCORES FOR 6R GROUP

						Iowa Tests										EPSB Tests			
Pupil No.	Group No.	Sex	Age	Laycock I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science	Social Studies
180	3	2	158	098	43.6	20	51	31	24	26	18	099	31	21	52	30	62	78	35
181	3	1	149	102	45.2	12	44	29	13	18	11	071	22	18	40	23	56	71	32
182	3	2	163	094	40.8	20	48	17	15	26	13	071	24	17	41	29	44	71	28
183	3	1	168	081	51.8	10	23	09	09	09	07	034	11	08	19	22	31	50	15
184	3	1	157	089	57.0	30	38	32	29	19	18	098	17	11	28	27	29	69	35
185	3	1	151	113	47.0	31	49	33	26	21	19	099	22	05	27	28	62	84	32
186	3	1	158	104	45.2	30	32	26	08	14	14	062	21	07	28	26	51	88	27
187	3	2	157	102	49.2	24	48	31	09	15	18	073	17	07	24	25	52	69	26
188	3	1	153	100	44.8	26	47	12	12	22	10	056	28	10	38	26	54	47	41
189	3	1	152	108	50.6	29	36	18	19	12	08	057	17	12	29	26	63	86	27
190	3	1	164	096	49.4	29	35	27	12	14	11	064	25	15	40	21	53	54	34
191	3	1	151	110	40.8	22	23	16	06	14	08	044	22	07	29	24	50	84	39
192	3	1	163	094	45.2	24	29	15	14	16	15	060	18	15	33	27	39	66	30
193	3	1	153	107	57.6	31	25	14	21	09	10	054	31	18	49	25	66	82	41
194	3	1	164	090	56.0	17	30	11	12	09	11	043	23	10	33	20	41	66	25
195	3	1	161	104	47.2	33	39	29	24	16	17	086	22	16	38	25	43	79	42
196	3	1	164	081	48.2	07	16	21	10	14	13	058	05	07	12	27	59	76	32
197	3	1	158	098	49.4	36	41	21	09	09	10	049	29	15	44	30	51	88	42
198	3	2	154	089	54.8	30	27	10	25	15	14	064	28	16	44	28	76	99	35
199	3	1	174	089	41.6	23	35	10	20	11	14	055	30	13	43	26	43	70	24
200	3	1	151	099	49.6	27	28	23	22	22	15	082	26	15	41	25	53	91	40
201	3	1	156	100	43.2	26	36	12	21	16	17	076	36	20	56	29	69	90	35
202	3	1	171	084	47.7	25	38	16	16	14	14	060	13	08	21	30	34	73	26
203	3	1	157	104	43.6	40	54	23	25	19	17	084	28	10	38	30	58	89	38
204	3	1	153	095	42.8	41	59	27	16	18	16	077	33	13	46	29	70	99	39
205	3	1	160	097	44.5	29	34	26	21	15	17	079	30	17	47	29	55	72	29

RAW ACHIEVEVEMENT SCORES FOR 6R GROUP

Pupil No.	Group No.	Sex	Age	Laycock I.Q.	Blishen No.	Iowa Tests										EPSB Tests			
						Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science	Social Studies
206	3	2	154	086	45.4	19	33	11	15	18	20	064	19	14	33	30	46	63	37
207	3	2	166	090	43.6	29	33	36	26	24	20	106	31	16	47	33	52	68	45
208	3	2	161	099	51.9	35	50	38	27	29	23	117	29	17	46	37	46	76	40
209	3	1	170	080	47.2	16	23	15	14	12	10	051	22	18	40	29	42	70	10
210	3	1	156	096	46.8	20	30	19	28	11	06	064	32	20	52	31	55	75	35
211	3	1	164	088	43.6	21	23	07	17	10	08	042	15	12	27	23	44	55	40
212	3	1	161	095	48.0	13	21	12	04	07	06	029	17	12	29	16	34	55	23
213	3	1	156	096	47.2	38	38	21	15	16	16	068	26	12	38	24	39	82	31
214	3	1	151	105	55.0	33	15	27	07	12	12	058	37	23	60	29	64	99	39
215	3	1	166	089	43.6	21	29	23	10	10	14	057	24	13	37	25	51	87	36
216	3	1	172	102	46.0	15	23	27	08	06	17	061	15	07	22	20	32	58	23
217	3	1	166	082	46.0	23	19	08	12	08	12	040	35	12	47	18	59	75	32
218	3	1	152	102	40.8	32	39	31	14	27	19	091	27	11	38	22	58	71	35
219	3	1	153	088	47.2	20	28	24	20	13	06	083	14	10	24	19	56	58	35
220	3	1	151	092	51.9	15	21	31	23	21	14	089	29	22	51	31	54	79	34
221	3	1	169	095	46.8	30	47	13	21	18	17	069	19	13	32	21	38	87	40
222	3	1	164	103	43.6	14	39	17	11	17	14	059	27	13	40	21	63	92	31
223	3	1	164	086	43.6	24	42	29	20	21	18	088	14	11	25	27	49	93	33
224	3	1	154	074	47.0	27	41	29	16	17	10	072	27	12	39	27	45	94	36
225	3	1	165	086	43.6	19	36	27	14	11	12	064	17	12	29	28	50	72	29
226	3	1	164	098	44.4	24	29	27	21	19	15	082	26	14	40	27	47	73	36
227	3	1	147	103	43.6	24	37	32	25	22	09	088	23	11	34	24	55	63	23
228	3	1	167	088	43.6	17	28	14	23	18	09	064	24	11	35	23	51	56	38
229	3	1	151	099	43.8	13	18	27	21	24	18	090	23	15	38	18	49	64	31
230	3	2	157	097	46.8	23	32	30	24	17	15	086	24	09	33	23	46	74	40

RAW ACHIEVEMENT SCORES FOR 7/7 GROUP

Pupil No.	Group No.	Sex	Age	Iowa Tests											EPSB Tests			
				Laycock I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science	Social Studies
231	4	2	156	108	50.2	25	42	29	29	28	18	104	33	21	54	31	77	79	45
232	4	2	163	082	41.6	21	23	21	17	14	14	066	17	08	25	25	41	52	37
233	4	1	154	097	49.4	31	50	15	25	26	19	085	23	20	43	32	55	84	35
234	4	1	159	101	40.6	27	32	22	28	25	20	095	28	16	44	22	61	74	39
235	4	1	150	128	49.6	41	57	19	25	20	13	077	33	22	55	31	70	98	42
236	4	1	170	082	47.2	17	16	14	11	10	09	044	22	13	35	16	45	45	18
237	4	2	164	087	35.2	20	33	28	16	20	16	080	26	16	42	27	47	52	31
238	4	2	150	086	49.2	17	21	09	06	07	07	029	16	07	23	20	31	55	31
239	4	1	157	087	43.2	24	34	21	14	22	13	070	18	16	34	25	44	70	31
240	4	1	159	077	47.2	04	22	06	09	11	06	032	16	11	27	07	26	44	18
241	4	1	164	082	54.0	25	23	13	16	12	11	052	22	14	36	24	61	79	28
242	4	1	164	078	44.4	07	16	10	18	12	09	049	10	11	21	13	42	50	25
243	4	1	163	085	43.6	17	23	08	14	16	09	047	20	09	29	18	42	54	26
244	4	2	150	100	46.8	23	33	29	20	19	21	089	26	17	43	20	50	59	28
245	4	2	152	095	41.6	15	29	29	15	13	16	073	22	14	36	23	37	61	29
246	4	1	153	093	53.3	35	40	27	17	10	17	071	26	16	42	21	43	69	31
247	4	1	150	098	40.8	04	53	23	22	16	22	083	35	19	54	31	52	83	42
248	4	1	180	074	57.7	10	18	12	12	08	08	040	10	07	17	19	24	52	18
249	4	1	159	089	41.6	29	31	21	16	11	17	065	18	09	27	27	38	87	28
250	4	1	157	090	46.5	27	46	27	27	19	14	082	28	14	42	26	47	83	35
251	4	1	163	087	42.4	28	41	27	16	15	08	066	26	23	49	27	59	91	35
252	4	2	150	095	44.4	14	38	23	13	16	14	066	11	10	21	18	30	27	27
253	4	2	137	103	47.2	18	43	26	22	18	16	082	18	14	32	24	42	58	30
254	4	1	160	092	43.4	28	39	26	15	16	09	056	21	14	35	28	49	78	28

RAW ACHIEVEMENT SCORES FOR 7/7 GROUP

						Iowa Tests										EPSB Tests			
Pupil No.	Group No.	Sex	Age	Laycock I.Q.	Blishen No.	Vocab.	Reading	Spelling	Capital.	Punctua.	Usage	Total Lang.	Arith.I	Arith.II	Total Arith.	Reading	S.T.A.	Science	Social Studies
255	4	2	159	094	43.4	34	45	36	28	24	19	107	23	23	46	27	49	76	30
256	4	1	159	101	81.2	32	35	19	24	12	22	077	33	15	48	27	58	89	47
257	4	1	148	119	61.8	34	50	24	18	21	17	080	28	23	51	29	62	94	34
258	4	1	164	105	57.0	41	54	25	21	21	16	083	29	14	43	32	64	99	99
259	4	1	162	088	63.8	20	27	12	09	11	16	048	20	15	35	13	46	52	66
260	4	1	158	092	54.8	24	24	17	18	19	17	071	14	05	19	26	38	62	74
261	4	1	161	089	57.0	36	37	10	11	19	17	057	17	10	27	24	35	84	87
262	4	2	153	102	51.7	27	22	22	23	13	16	074	34	20	54	31	67	72	82
263	4	1	150	129	63.8	41	57	44	23	30	20	117	36	19	55	30	85	99	99